

CHARMAINE TAVARES
Mayor



DEC 23 2010

JEFFREY K. ENG
Director

**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI**

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December 8, 2010

Ms. Katherine Kealoha, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Kealoha:

Subject: Draft Environmental Assessment
Ulupalakua Water System Improvements
Ulupalakua, Maui, Hawaii

The Department of Water Supply, County of Maui has reviewed the Draft Environmental Assessment (DEA) for the proposed water system improvements in Ulupalakua, Maui and anticipates a Finding of No Significant Impact (FONSI) determination. Please publish a notice of availability for this project in the December 23, 2010, issue of *The Environmental Notice*.

We have enclosed a completed OEQC Publication Form, a hard copy of the Draft EA, and a PDF file of the DEA and MS Word file of the completed Publication Form on disk.

Please call Glen Koyama of Belt Collins Hawaii at (808) 521-5361 if you have any questions.

Sincerely,

JEFFREY K. ENG
Director

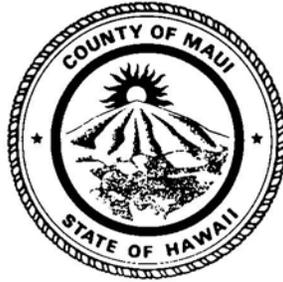
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Enclosure

"By Water All Things Find Life"

**DRAFT
ENVIRONMENTAL ASSESSMENT**

**‘ULUPALAKUA WATER SYSTEM IMPROVEMENTS
‘Ulupalakua, Maui, Hawai‘i**



**Department of Water Supply
County of Maui**

**DRAFT
ENVIRONMENTAL ASSESSMENT**

**'ULUPALAKUA WATER SYSTEM IMPROVEMENTS
'Ulupalakua, Maui, Hawai'i**

November 2010

**Prepared for:
Department of Water Supply
County of Maui**

**Prepared by:
Belt Collins Hawaii
Honolulu, Hawai'i**

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- D. Archaeological Assessment in Support of the 'Ulupalakua Water System Replacement Project, Kama'ole, Paeahu, Palauea, Keauhou, Papa'anui, and Kanaio, Makawao (Kula and Honua'ula) District, Maui.
- E. Cultural Impact Assessment in Support of the 'Ulupalakua Water System Replacement Project, Kama'ole, Paeahu, Palauea, Keauhou, Papa'anui, and Kanaio, Makawao (Kula and Honua'ula) District, Maui. (Draft Report).

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ACRONYMS AND ABBREVIATIONS

BMP	Best Management Practices
CSH	Cultural Surveys Hawai'i
CZM	Coastal Zone Management
DBEDT	Department of Business, Economic Development and Tourism (State of Hawai'i)
DHHL	Department of Hawaiian Home Lands (State of Hawai'i)
DLNR	Department of Land and Natural Resources (State of Hawai'i)
DOH	Department of Health (State of Hawai'i)
DWS	Department of Water Supply (County of Maui)
DWSRF	Drinking Water State Revolving Fund
EA	Environmental Assessment
EIS	Environmental Impact Statement
EPA	Environmental Protection Agency (United States)
FIRM	Flood Insurance Rate Map
FITs	Free and Independent Travelers
FONSI	Finding of No Significant Impact
GPD	gallons per day
HAR	Hawai'i Administrative Rules
HRS	Hawai'i Revised Statutes
MECO	Maui Electric Company Ltd.
MGD	million gallons per day
NAAQS	National Ambient Air Quality Standards
NPDES	National Pollutant Discharge Elimination System.
NRHP	National Register of Historic Places
PVC	polyvinyl chloride
SHPO	State Historic Preservation Officer
SMA	Special Management Area
USGS	United States Geological Survey

1 SUMMARY

PROPOSING AGENCY:	Department of Water Supply (DWS), County of Maui
APPROVING AGENCY:	DWS, County of Maui
GENERAL PROJECT DESCRIPTION:	DWS is proposing to improve the existing 'Ulupalakua Water System that currently serves the Kama'ole-Kanaio area. The improvements are expected to bring the existing aging water system up to current <i>Water System Standards</i> , State of Hawai'i, 2002. No new source of water or expansion of service area is proposed. The proposed improvements will include approximately 10.5 miles of upgraded replacement pipelines and associated upgraded replacement pressure reducing valve stations/systems, service laterals, water meters, fire hydrants and water tanks.
PROJECT LOCATION:	The replacement transmission line will extend from Kama'ole Tank to Kanaio on the southwestern flank of Mt. Haleakalā along the approximately 3,200-foot to 2,800-foot elevations. Four replacement laterals will extend makai from the transmission line to the lower elevations along Kula Highway at Paeahu, Palauea, 'Ulupalakua, and Kanaio.
PRELIMINARY DETERMINATION:	Anticipated Finding of No Significant Impact (FONSI)
CONSULTED AGENCIES:	<u>Federal Agencies</u> U.S. Department of the Army U.S. Fish and Wildlife Service U.S. Natural Resources Conservation Service <u>State Agencies</u> Agricultural Resource Management Division, Department of Agriculture Environmental Management Division, Department of Health (DOH) Environmental Health Services Division, DOH Forestry and Wildlife Division, Department of Land and Natural Resources, (DLNR) Land Division, DLNR Land Use Commission, Department of Business, Economic Development and Tourism (DBEDT) Na Ala Hele Division, DLNR Office of Hawaiian Affairs Office of Planning, DBEDT State Historic Preservation Division, DLNR Water Resource Management Division, DLNR <u>County Agencies</u> Department of Fire and Public Safety Department of Management Department of Planning Department of Public Works and Waste Management

Utility Companies

Maui Electric Company Ltd.

Verizon Hawaii

Others

Earth Foundation

Haleakala Ranch Co.

Kula Hospital

Melody Farm

Sally Raisbeck

Ulupalakua Ranch Inc.

2 DESCRIPTION OF THE PROPOSED ACTION

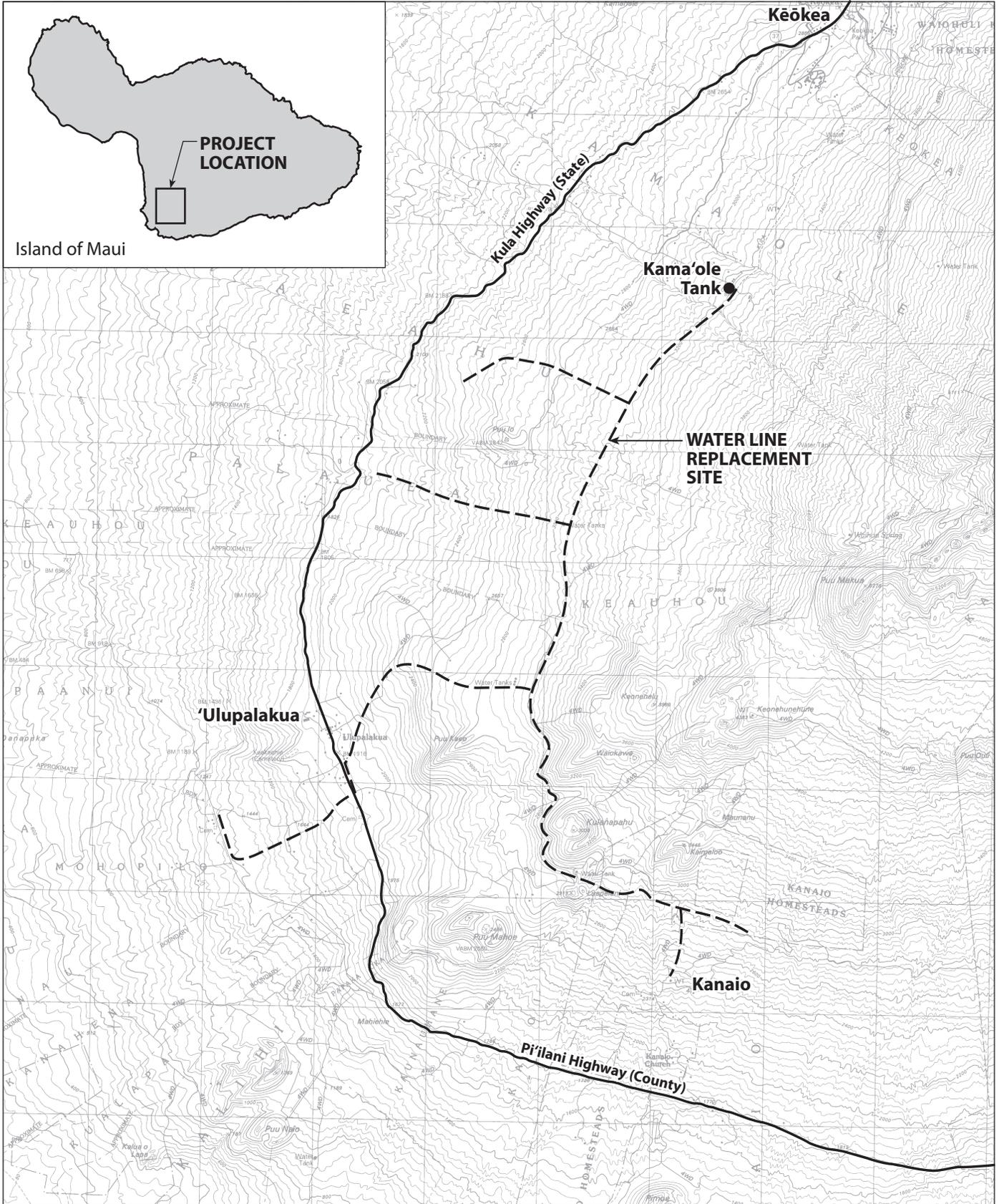
2.1 Project Objective

The existing water system serving the Kama'ole to Kanaio area in the 'Ulupalakua region of Haleakalā is outdated and deteriorating (see Figure 1). Substantial effort by DWS is presently required to maintain the waterlines in proper operating condition. The waterlines are also inadequately sized to accommodate current demand and meet minimum fire flow requirements.

DWS is proposing to replace a section of the Upper Kula Water System, known as the 'Ulupalakua Water System, with new larger-capacity pipelines. These new ductile-iron pipes will follow the same general alignment as the existing lines and include upgraded/additional pressure reducing valve stations, replacement service laterals, water meters, fire hydrants, and possible replacement water tanks. The increase in pipe size throughout the system will reduce pressure loss and improve operational/efficiency in the lines. In addition, to meet DWS minimum fire flow requirements, the larger sized pipes will provide greater capacity to serve DWS customers. The proposed improvements do not include a new source of water or distribution lines to new customers.

Preparation of this Environmental Assessment (EA) for the proposed waterline replacement began in 2003. In 2004, work on the environmental document was halted before it could be completed. Uncertain economic conditions and the use of County funds for higher priority projects required the replacement waterline project to be scheduled for a later date.

In the present, funding has been made available for the 'Ulupalakua project and the County is once again proceeding to complete the work that was started six years ago. This EA contains extensive information on existing conditions that were collected during 2003 and 2004. According to local sources, very little, if any, of those conditions have changed from those earlier times. Certain updates, however, were made on project scope refinements, current events, and time-sensitive environmental conditions.



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Figure 1
LOCATION MAP

'Ulupalakua Water System Improvements
East Maui, Hawaii

2.2 Background

'Ulupalakua's existing water system, which comprises the southernmost segment of the Upper Kula Water System, consists of a transmission line that extends approximately five miles south from the existing 500,000-gallon Kama'ole Tank (elevation 3,238 feet) to a lateral that leads to a 12,000-gallon tank (elevation 2,435 feet) in Kanaio (see Figure 2). The cast iron (CI) and high density polyethylene (HDPE) transmission line varies in diameter from 1 inch to 6 inches and traverses primarily pasturelands, agricultural fields, and open space. Many segments of the waterline lay on or near the surface of the ground.

Four lateral waterlines, ranging in length from 4,100 feet to 13,700 feet with diameter sizes ranging from 1 inch to 6 inches, extend makai from the transmission line toward Kula Highway and Pi'ilani Highway at Paeahu, Palauea, 'Ulupalakua, and Kanaio. These lines were installed to serve customers in the area. An existing lateral that extends makai from the Kama'ole Tank is not part of this project's planned improvements.

Part of the Ulupalakua Water System includes DWS and private storage tanks, which are constructed predominantly of steel. DWS water tanks range in size from 500 to 500,000 gallons. Some of these tanks are not in use or have been abandoned.

The existing water system was built in phases generally beginning in the early 1970s and, to date, has not been upgraded or replaced. Frequent breaks in the waterlines have left users without water for several hours and sometimes days. The age and poor condition of the pipes have contributed to these leaks and breaks. Moreover, the exposure of the waterlines at the ground surface to weather, natural hazards, and cattle have also contributed to damages to the lines.

The length, size, and condition of the transmission line results in substantial pressure loss in the system. This loss limits the rate of flow and ability of the line to adequately serve the area customers.

Finally, the system's existing lines do not meet DWS's minimum fire flow requirements, which require a distribution system capable of accommodating 500 gallons-per-minute (gpm) for agricultural areas and 1,000 gpm for rural areas.

2.3 Description of the Proposed Action

DWS is proposing to replace the existing 23,700-foot transmission line in the 'Ulupalakua Water System with a new, larger pipeline (see Figure 3). The replacement 8-inch and 12-inch ductile iron pipe will have a greater capacity and improved durability than the existing 2-inch, 2½ inch, 4-inch, and 6-inch pipes.

Four laterals with lengths of 5,400 feet, 6,400 feet, 13,700 feet, and 4,100 feet extend makai of the transmission line. Two of the laterals currently serve ranch users, one lateral serves 'Ulupalakua village, and the remaining lateral serves a small settlement in Kanaio. These laterals will be replaced by 8-inch ductile-iron pipelines. A 1-inch pipeline that extends beyond the Kanaio lateral, a distance of approximately 2,150 feet, will also be replaced by an 8-inch ductile-iron pipeline. The total length of the replacement transmission line and laterals is approximately 55,450 feet.

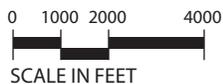
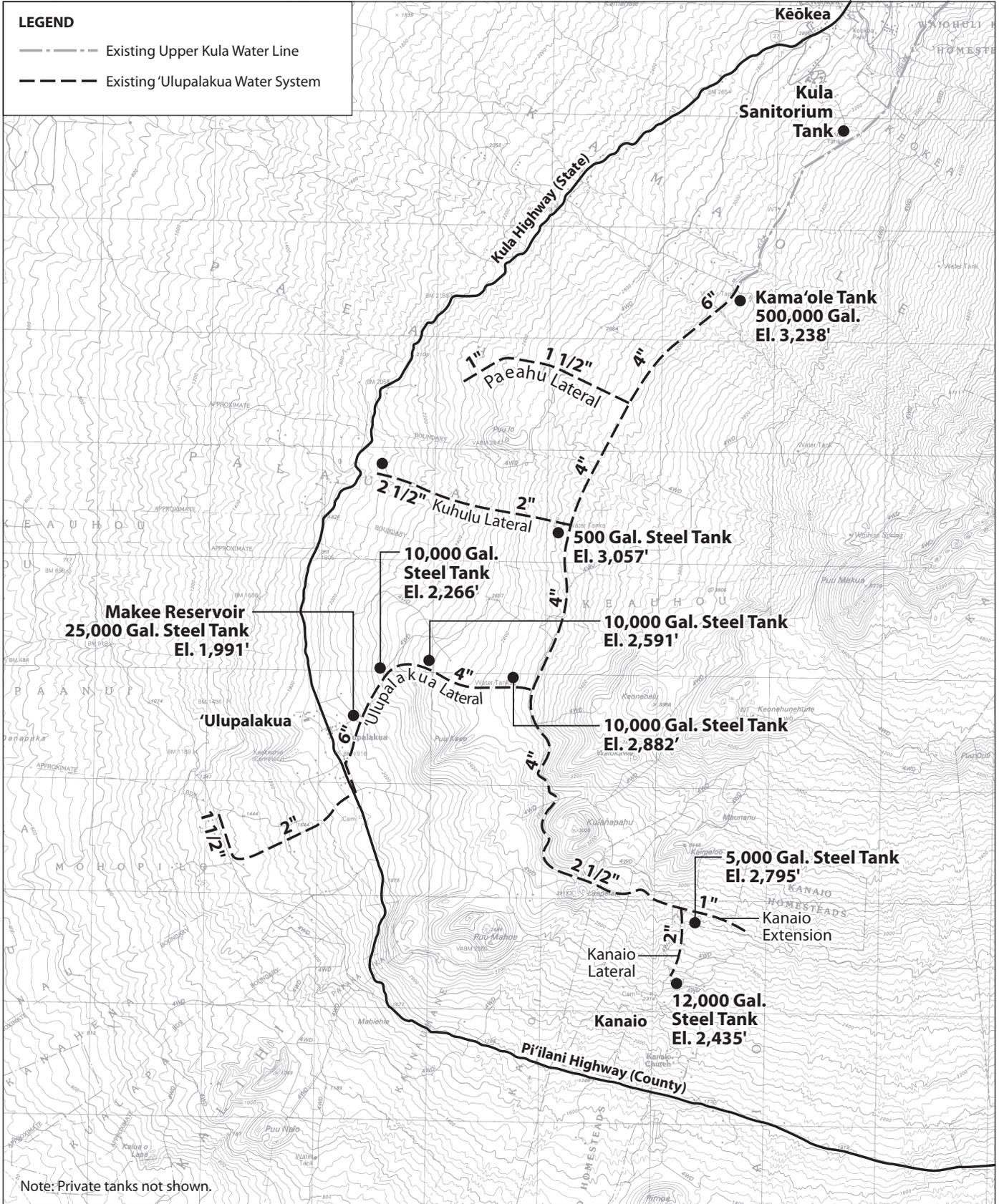
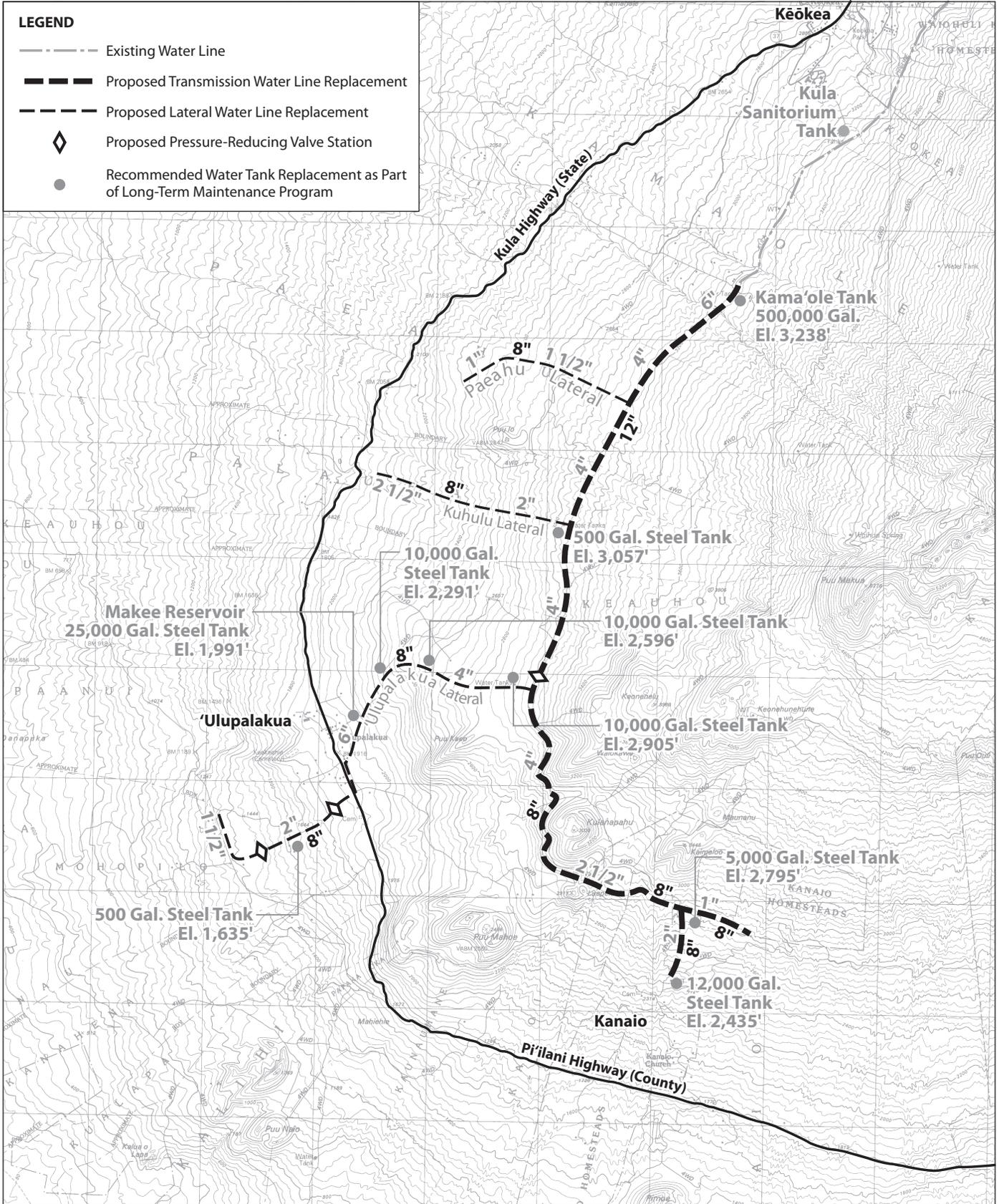


Figure 2
EXISTING WATER SYSTEM

'Ulupalakua Water System Improvements
East Maui, Hawaii



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Figure 3
PROPOSED REPLACEMENT WATER LINE

'Ulupalakua Water System Improvements
East Maui, Hawaii

The replacement pipelines have been sized to meet DWS's minimum fire flow requirements and include capacity to accommodate maximum daily demand and peak hour flow (without fire flow).¹ The new pipes will be installed completely underground, reducing the risk of damage. An existing unimproved road is located to a large extent adjacent to the transmission line and readily serves as a service/maintenance access for the water system.

The proposed improvements will also include accessory facilities such as pressure reducing valve stations, fire hydrants, and other minor accessory components. The pressure reducing valves will be installed to control flow and pressure throughout the system. The existing water tanks on the system, which are aging and deteriorating, require frequent repair and maintenance. These tanks will require replacement in the future as part of the system's long-range maintenance program. As the tanks are replaced, they will require meeting DWS's standards on facility size and location.

The 'Ulupalakua Water System is connected to the main Upper Kula Water System via a 6-inch/8-inch transmission line that extends north from the Kama'ole Tank. The source of the Upper Kula Water System is the streams of the Waikamoi Rain Forest. The collected water is treated at the Olinda Water Treatment Plant near Palani and distributed through the region via transmission lines, storage tanks, and service laterals. The DWS is currently contemplating upgrading the section of the transmission line between the Kama'ole Tank and Kula Sanitorium Tank to further improve the efficiency of the system (this section of the line is not included in the current EA). No timetable has been established for this improvement.

2.4 Estimated Cost

Construction of the replacement waterlines and accessory facilities is estimated (order-of-magnitude) to cost approximately \$8.3 million (in 2010 dollars). This estimate does not include planning, permitting, and design costs. Funding for the project will come from the County DWS. Supplemental funding may come from federal funds through the State of Hawai'i's Drinking Water State Revolving Fund (DWSRF) program. Use of DWSRF monies would constitute a federal action and require the project to meet all Hawai'i DWSRF program requirements.

2.5 Construction Schedule

Construction funding of \$550,000 is currently available from the County to start installation of a portion of the main replacement waterline and 'Ulupalakua lateral. As more funding become available, construction will continue to be scheduled to complete the remainder of the proposed water system improvements.

3 DESCRIPTION OF THE AFFECTED ENVIRONMENT

3.1 Regional Setting

The 'Ulupalakua Water System is located in the 'Ulupalakua region of Upcountry Kula, where farms, orchards, vineyards, grazing lands, rural residences, and open space occupy the landscape. The main industry in 'Ulupalakua is agriculture with the predominant activity being ranching.

¹ Demand factors of 1.5 times average day and 3.0 times average day were used for maximum daily demand peak hour flow, respectively.

Ulupalakua Ranch and Haleakala Ranch are the largest operators. Tedeschi Winery, another large operator in the region, has a vineyard just outside of ‘Ulupalakua village, the small commercial center of the district. An independent farmer has a strawberry patch on Ulupalakua Ranch lands and many of Maui’s floral nurseries are located to the north of Kama‘ole.

The rural towns of Pukalani (pop. 7,473) and Makawao (pop. 6,355) are the largest population settlements in Upcountry Kula.² These towns have the essential community facilities, including markets, general and specialty stores, restaurants, schools, playgrounds, and churches. Other Upcountry settlements occur as small clusters of rural residences scattered throughout the Upper Kula region south of Pukalani toward ‘Ulupalakua. These settlements have a combined population of approximately 7,000 people. Within the project area, between Kēōkea/Kama‘ole and Kanaio, the population is very sparse. It is estimated that no more than 180 families live in this section of the region.³

3.2 Existing Water System and Land Use

‘Ulupalakua Water System’s existing transmission line extends approximately five miles from the Kama‘ole Tank (elevation 3,238 feet) in the Kama‘ole land tract to the two Kanaio Tanks (elevations 2,795 feet and 2,420 feet) in Kanaio. Virtually, the entire length of the existing transmission line traverses grazing, agricultural, and open-space lands (see Figure 4). The existing alignment does not traverse any forest reserves, vineyards, orchards, or croplands, nor impact any residential homes, yards, or other building structures.

Three of the four associated laterals traverse grazing and open-space lands. The fourth lateral extends through ‘Ulupalakua village to a cluster of homes at the 1,360-foot elevation.

There are a number of DWS storage tanks that connect with the ‘Ulupalakua Water System as described below in Table 1.

TABLE 1: Existing DWS Tanks in Kama‘ole-Kanaio

Tank	Capacity (in gallons)	Approximate Elevation (in feet)	Construction
Kama‘ole Tank	500,000	3,238	Steel
Kuhulu Tank 1	500	3,057	Steel
‘Ulupalakua Tank 1	10,000	2,882	Steel
‘Ulupalakua Tank 2	10,000	2,581	Steel
‘Ulupalakua Tank 3	10,000	2,266	Steel
‘Ulupalakua Tank 4	25,000	1,991	Steel
Kanaio Tank 1 (not in use)	5,000	2,795	Steel
Kanaio Tank 2	12,000	2,420	Steel

Source: Maui County, Dept. of Water Supply, Water Systems Map

The ‘Ulupalakua Water System also includes valves, pressure breakers, pressure reducers, air vents and meters.

² 2000 U.S. Census. Data from 2010 U.S. Census not available.

³ Estimate by U.S. Postal Service personnel.

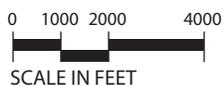
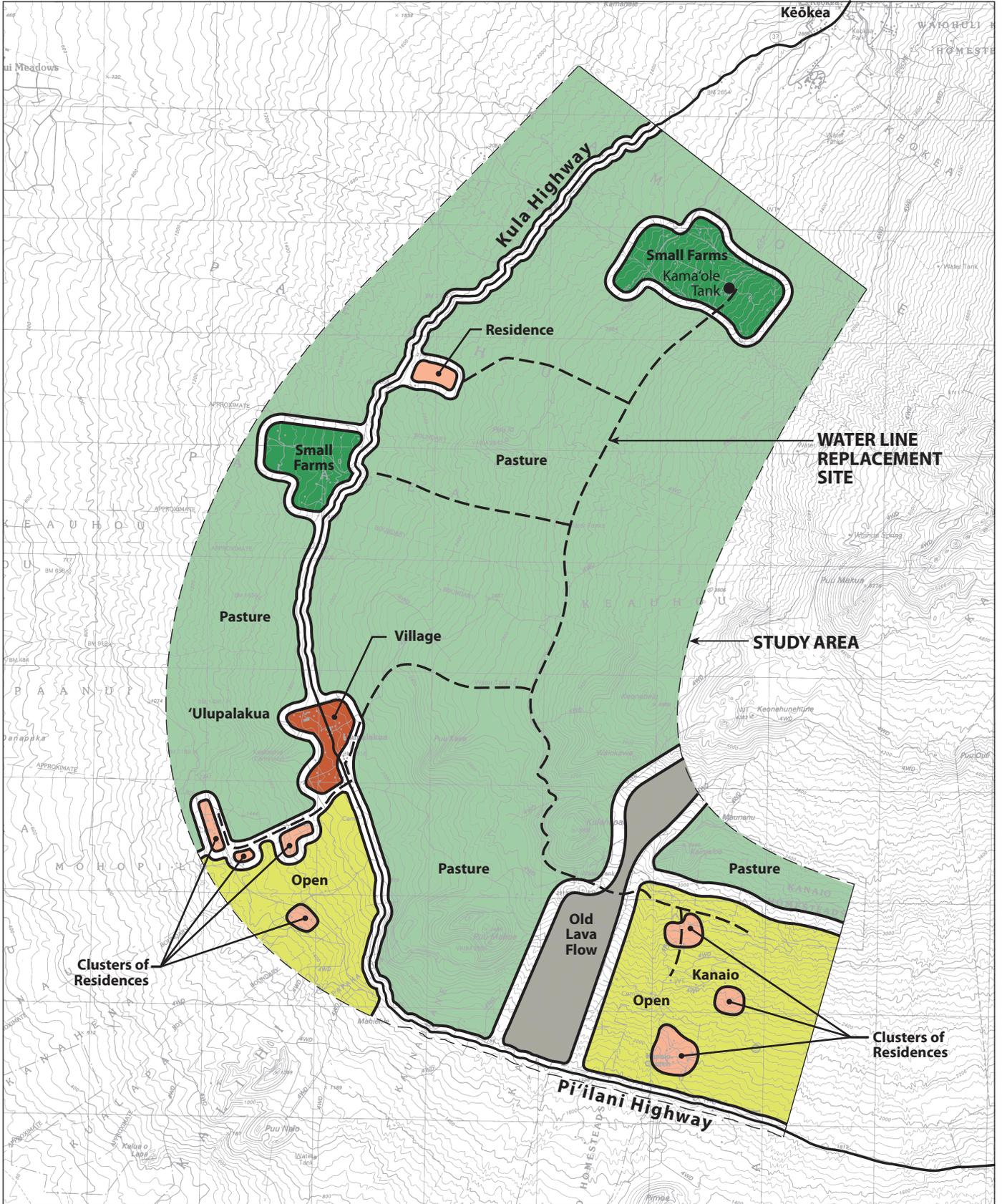


Figure 4
EXISTING LAND USE

'Ulupalakua Water System Improvements
East Maui, Hawaii

Unimproved maintenance roads and open pasture lands currently provide access to the existing lines. Some of the roads may have pre-dated the waterlines, while others have been developed specifically to service the DWS system. In the open fields, these access roads are predominantly four-wheel drive dirt roads, and those in 'Ulupalakua village are typically paved. Wire fences delineate some of the property boundaries in the area, and gates with lock and key control access through different paddocks.

During the 2009 fiscal year, the Upper Kula Water System, which includes the 'Ulupalakua System, had approximately 2,300 service connections with a total 12-month consumption volume of approximately 500 million gallons of water by domestic and agricultural users.⁴ In Lower Kula, there were about 1,100 services with a total 12-month consumption of approximately 735 million gallons. The large consumption of water in Lower Kula is directly tied to the higher number of agricultural activities in the area compared with Upper Kula.

In the Kama'ole to Kanaio area, there were approximately 80 service connections with a total 12-month consumption volume of approximately 43.0 million gallons.⁵ The number of users or customers in the area has not changed since 2002 as the number of service connection recorded at that time was also at approximately 80 to 81.⁶ In data developed for DWS, the projected gallons-per-day (GPD) volume that would be drawn from the system in 2010 is 171,000.⁷ The maximum GPD (1.5 x GPD) would be 256,500. In 10 years, the projected consumption (based on land use demographic forecast) would be 193,000 GPD with a maximum GPD of 289,500.

3.3 Land Tenure

The alignment of the proposed replacement waterline traverses a number of properties, including many that are owned by large landowners (see Figure 5 and Table 2). The largest owners are Ulupalakua Ranch (Maui's largest ranch covering approximately 30,000 acres) and Haleakala Ranch,⁸ which together with Ulupalakua Ranch, comprise more than 80 percent of the lands that would be affected by the proposed project. Notably, Ulupalakua Ranch comprises approximately 95 percent of the two affected ranch lands.

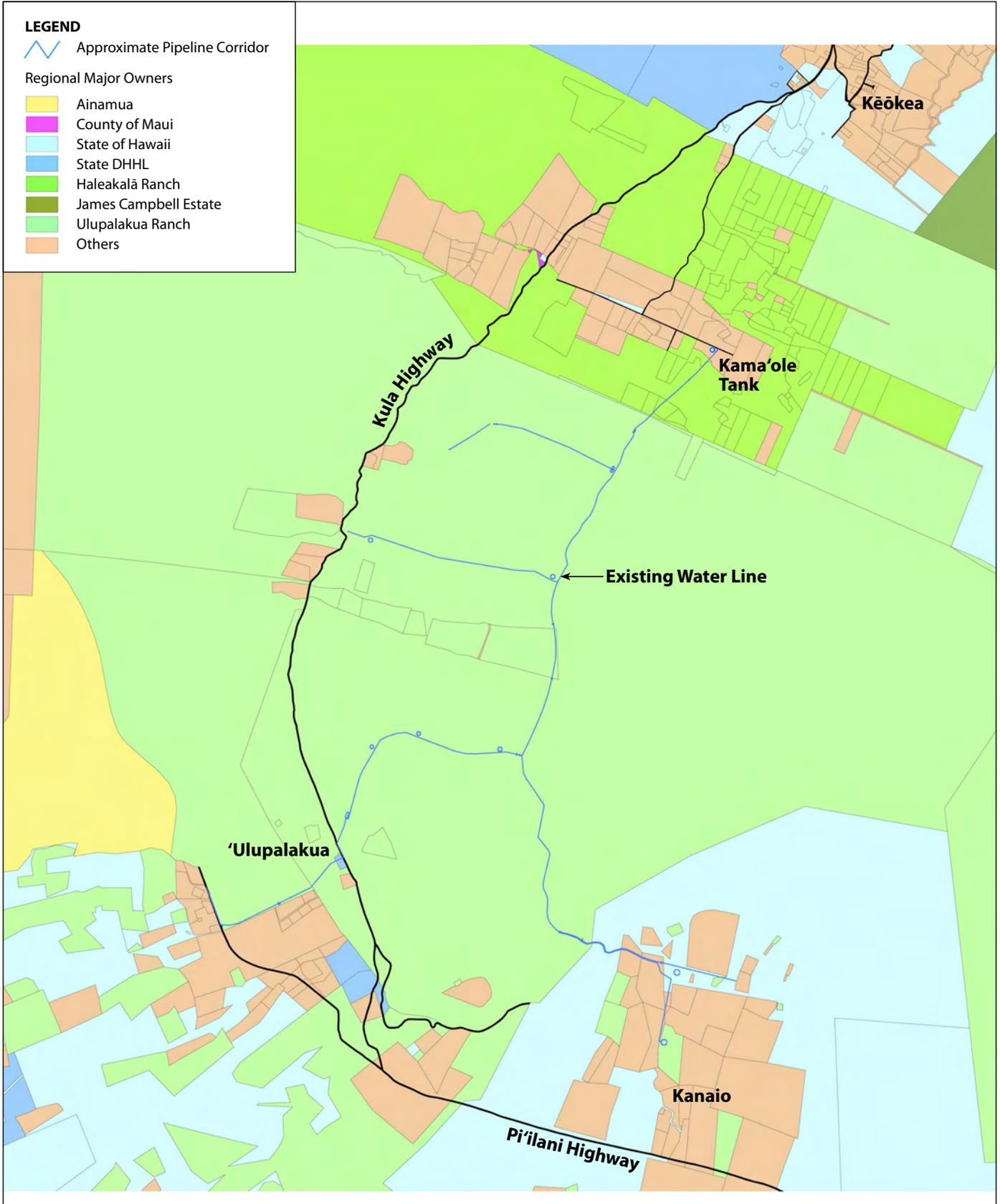
⁴ Department of Water Supply, County of Maui, *Annual Report, Fiscal Year Ended June 30, 2009*.

⁵ Ibid.

⁶ Department of Water Supply, County of Maui, *Annual Report, Fiscal Year Ended June 30, 2002*.

⁷ Department of Water Supply, County of Maui, *Maui County Water Use and Development Plan: Water Use and Demand, Department of Water Supply, Draft*, prepared by Carl Freedman, Haiku Design & Analysis, 2007.

⁸ Recent sales to private interests of some Haleakala Ranch lands have reduced its portion of the holding in the study area.



Source: 2004 Property Records



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Figure 5
LAND OWNERSHIP

'Ulupalakua Water System Improvements
East Maui, Hawaii

TABLE 2. Land Ownership Within Waterline Corridor

Tax Map Key	Land Owner	Area (in acres) *
2-1-03:22	James Halama	48.2
2-1-03:24	Anna S.U.K. Tam Trust, <i>et al.</i>	10.5
2-1-03:26	Ulupalakua Ranch, Inc.	21.6
2-1-03:32	Christian P. Erdman	12.2
2-1-03:38	Ulupalakua Ranch, Inc.	1.4
2-1-03:40	Heirs of Kahoe, Jeremiah Reyes	4.7
2-1-03:50	State of Hawai'i (lease Ulupalakua Ranch, Inc.)	1,546.0
2-1-08:1	Ulupalakua Ranch, Inc.	2,564.3
2-1-08:107	Ulupalakua Ranch, Inc.	955.5
2-1-09:1	Ulupalakua Ranch, Inc.	5,891.6
2-1-09:22	Ulupalakua Ranch, Inc.	60.0
2-2-01:4	Kamaole Ranch LLC	265.8
2-2-01:10	Cyrus M. Monroe	11.0
2-2-01:11	Cyrus M. and Jill A. Monroe	0.3
2-2-01:125	Kamaole Ranch LLC	6.8
2-2-01:126	Kamaole Ranch LLC	5.0
2-2-01:128	Kamaole Ranch LLC	6.5

Note: * Total area of TMK parcel. Waterline traverses a portion of the property.

Source: Property Tax Maps, State of Hawai'i, and Real Property Assessment Division, County of Maui, June 2010.

Installed approximately 35 years ago, the existing waterlines do not occupy easements in the open fields that legitimize their occupational rights over the affected properties. This condition apparently has not been a problem with the landowners, who have graciously allowed DWS to use their properties and have access to the waterlines for repair and maintenance purposes.

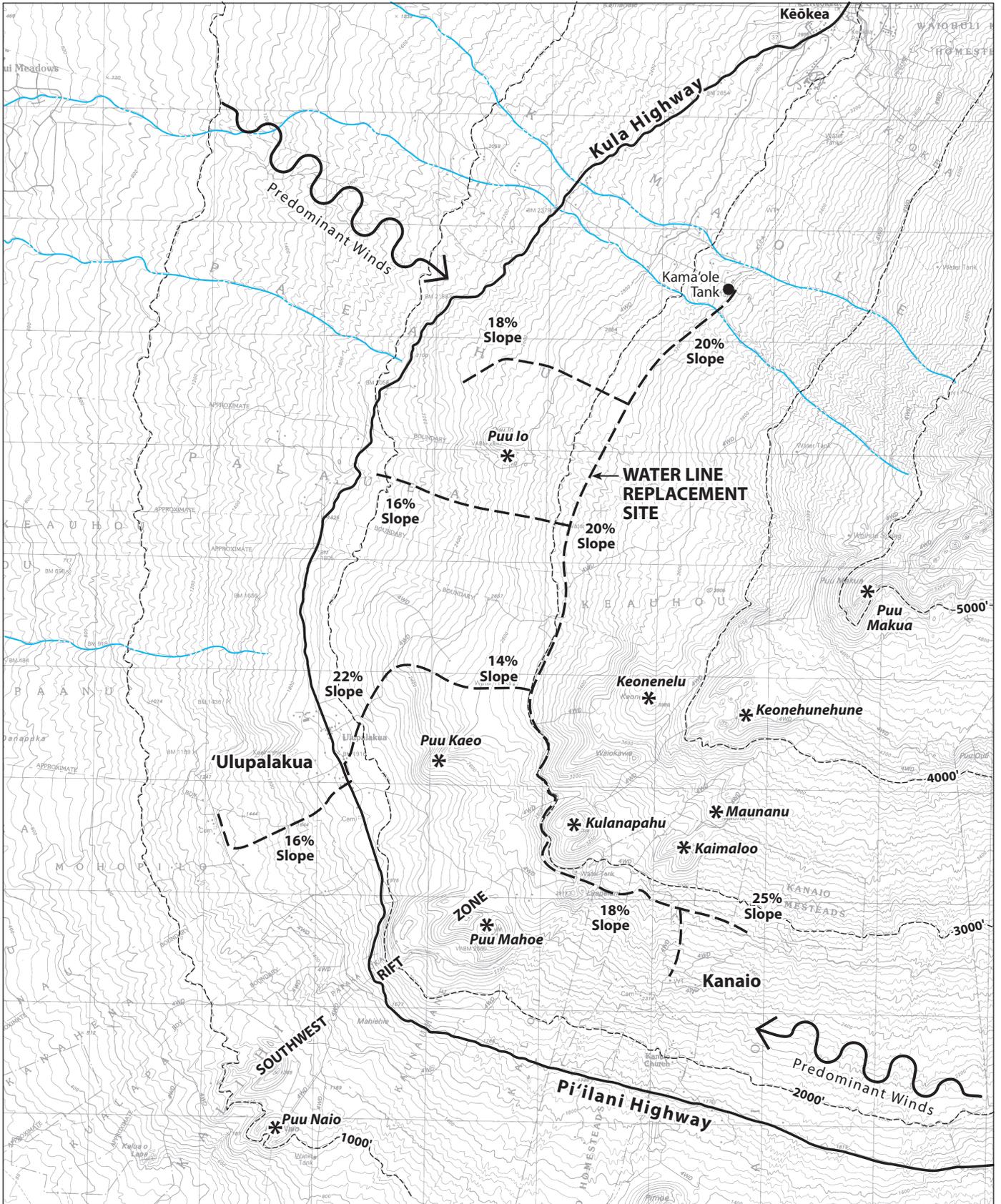
In 'Ulupalakua village, the waterlines are located within existing public rights-of-way or utility easements.

With the construction of the new waterlines, the DWS will establish easements over the lands it does not own for the construction of the replacement lines, long-term legal occupancy of the properties, and a permanent access for repair and maintenance purposes. Once the new lines are in service, existing at-grade lines will be removed and any associated below-grade lines will be abandoned in place.

3.4 Physiography

The project area is located at the mid-elevations of Haleakalā's southwestern flank where the slopes are gentle to moderate and the overall terrain is rolling hills and open space (see Figure 6). The general gradient of the project area varies from 20 percent in Kama'ole, 14 to 22 percent in 'Ulupalakua, to 25 percent in Kanaio. Elevations are from approximately 3,200 feet down to approximately 1,300 feet and extend from the land division of Kama'ole in the north to Kanaio in the south.

The relative youth of Haleakalā explains the absence of deep gulches and ravines particularly on the southwestern slopes of the mountain. Well-formed valleys are more evident on the older West Maui Mountains located across the isthmus from Haleakalā.



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Figure 6
EXISTING SITE CONDITIONS

'U'upalakua Water System Improvements
East Maui, Hawaii

Between 'Ulupalakua and Kanaio is a rift zone that extends from the top of Haleakalā to the sea. It is lined with pu'u's, some of which are as high as 350 feet. The most prominent pu'u's in the project area are Pu'u Māhoe and Kulanapahu.

The rift zone provides a clear demarcation between the southern flank and western flank of Haleakalā and a change in the region's slope and soil. As previously noted, the slope on the western flank is less dramatic, and the soil is deeper. The slope on the southern flank is steeper, and the soil is shallower and rockier, conditions that are not suitable for grazing.

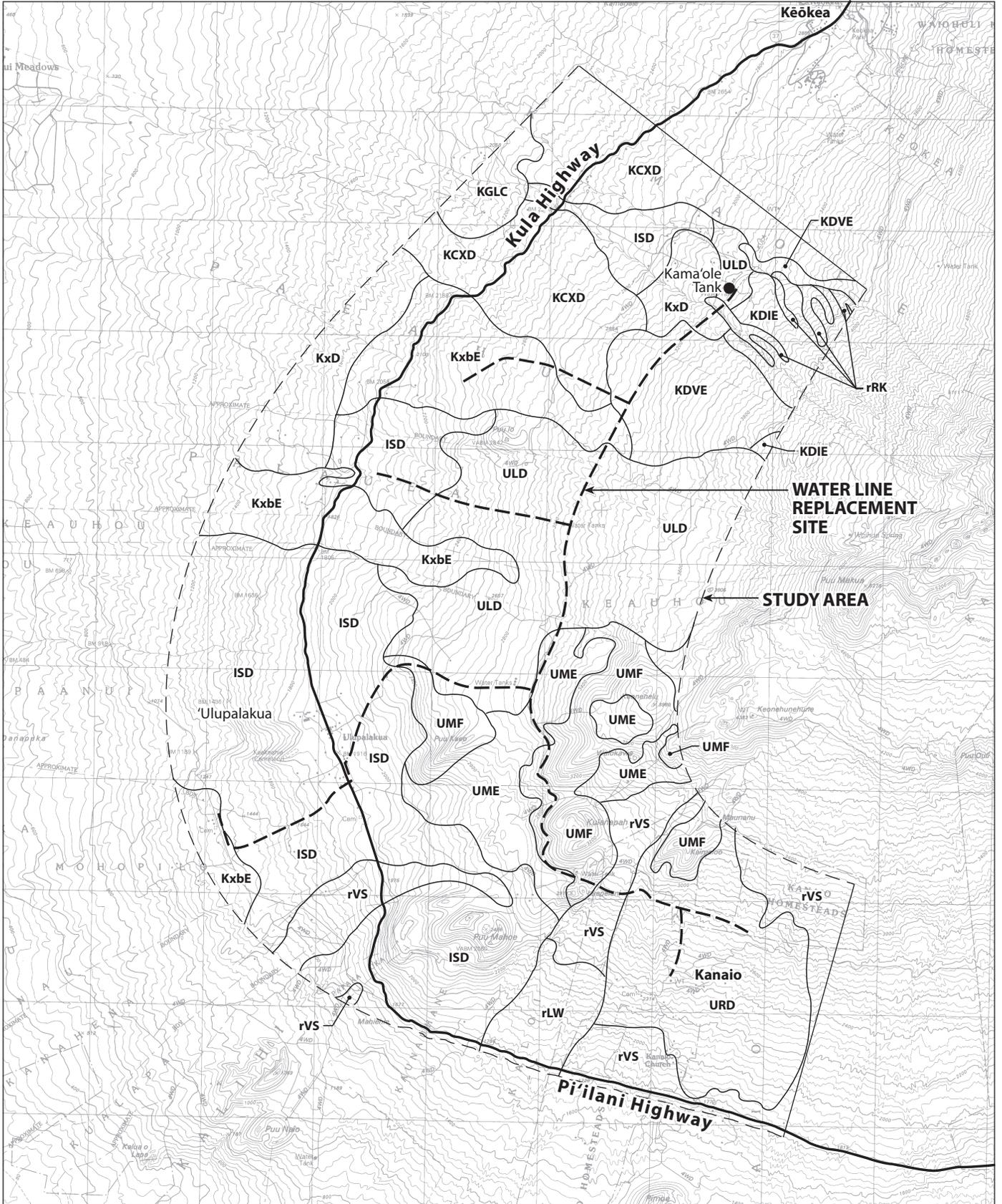
3.5 Geology

Haleakalā (elevation 10,023 feet), a shield volcano, is considered dormant. The last eruption occurred in about 1790 on the lower slopes along the southwest rift zone. Predicting future volcanic activity on Haleakalā is very speculative and unpredictable, but historically such activity is known to occur every several hundred years. The southwest rift zone, which traverses the project area, indicates a vulnerable spot on the mountain and a potential area for geological occurrences.

3.6 Soils

The Kama'ole to Kanaio area encompasses a wide variety of soil types. The predominant soils are 'Ulupalakua silt loam, which is well drained and derived from volcanic ash and material weathered from cinder, and soils of the Uma series, which are sandy and excessively drained and derived also from volcanic ash and material weathered from cinder (see Figure 7 and Table 3).

The Capability Classification of these soils along with the other soils in the project area range from IV to VII indicating that their suitability for crop use has limitations due to primarily stoniness or shallow soils and sometimes severe erosional conditions. Their primary use is grazing as evidenced by long-standing ranching operations in the area. Other agricultural activities, such as crop farming, may be possible with extensive work on the land, including stone clearing and soil treatment.



Note: See Table 2 soil legend.



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**Figure 7
SOILS**

'Ulupalakua Water System Improvements
East Maui, Hawaii

TABLE 3. Soils in Project Area

Type	Symbol	Description
Western Slope of Haleakalā:		
Io silt loam	ISD	This soil, 7 to 25 percent slopes, is on smooth, low mountain slopes and found in small cobbly areas and small, steep areas near cinder cones. It consists of well-drained soils developed in volcanic ash and material weathered from cinders. Permeability is moderately rapid, runoff is slow to medium, and erosion hazard is slight to moderate. Its Capability Classification is IVE, nonirrigated.
Kaipoiioi very rocky loam	KDVE	This soil, 7 to 40 percent slopes, is found on rolling high mountain slopes with rock outcrops that cover 10 to 25 percent of the ground surface. This soil is well drained, and developed in volcanic ash, and in material weathered from cinders. Its Capability Classification is VIs, nonirrigated.
Kula very rocky loam	KxbE	This soil, 12 to 40 percent slopes, consists of well-drained rocky loam soils developed in volcanic ash on upland areas. Rock outcrops cover 10 to 25 percent of the surface. Runoff is medium and the erosion hazard is moderate. Its Capability Classification is VIs, nonirrigated.
Kula loam	KxD	This soil, 12 to 20 percent slopes, consists of well-drained soils developed in volcanic ash on upland areas. It is nearly free of cobblestones. Its Capability Classification is IVE, nonirrigated.
Rock land	rRK	Rock land is made up of areas where exposed rock covers 25 to 90 percent of the surface. The rock outcrops are mainly basalt and andesite. This land type is nearly level to very steep. Its Capability Classification is VIIs.
'Ulupalakua silt loam	ULD	This soil, 7 to 25 percent slopes, consists of well-drained silt loam soils developed in volcanic ash and material weathered from cinders. It is found on smooth intermediate mountain slopes and in small, very steep areas. Permeability is moderately rapid, runoff is slow, and erosion hazard is slight. Its Capability Classification is IVE, nonirrigated.
Uma loamy coarse sand	UME	This soil, 15 to 40 percent slopes, consists of excessively coarse sand drained, sandy soils developed in volcanic ash and material weathered from cinders. It is found on moderately sloping to very steep intermediate mountain slopes and a few cinder cones and small areas of rock outcrop. Permeability is very rapid, runoff is slow, and erosion hazard is slight to moderate. Its Capability Classification is VIs, nonirrigated.
Uma loamy coarse sand	UMF	This soil, 40 to 70 percent slopes, consists of excessively coarse sand drained, sandy soils developed in volcanic ash and material weathered from cinders. It is found on moderately sloping to very steep intermediate mountain slopes and a few cinder cones and small areas of rock outcrop. The erosion hazard is severe. Its Capability Classification is VIIs, nonirrigated.
Very stony	rVS	This land type, 7 to 30 percent slopes, consists of areas of land where 50 to 90 percent of the surface is covered with stones and boulders. On Maui, this land type consists of young 'a'a lava that has a thin covering of volcanic ash that locally extends deep into cracks and depressions. Its Capability Classification is VIIs, nonirrigated.
Uma rocky loamy coarse sand	URD	This soil, 7 to 25 percent slopes, consists of excessively loamy coarse drained, sandy soils developed in volcanic ash and sand material weathered from cinders. Rock outcrops cover 5 to 10 percent of the surface. Runoff is medium, erosion hazard is moderate. Its Capability Classification is VIs, nonirrigated.

Notes: Capability Classification indicates, in a general way, the suitability of soils for most kinds of crops. The classifications range from "I" which is soils that have few limitations that restrict their use to "VII" which are soils that have severe limitations that preclude their use for commercial plant production. The subscript "e" indicates severe erosion conditions, and "s" indicates severe stoniness, shallowness, unfavorable texture, or low water-holding capacity conditions.

Source: U.S. Department of Agriculture, Soil Conservation Service in cooperation with The University of Hawai'i, Agricultural Experiment Station, *Soil Survey of Islands of Kaua'i, O'ahu, Maui, Moloka'i, and Lāna'i, State of Hawai'i*, 1972.

3.7 Flora

A botanical survey was conducted by Char and Associates in November 2003. Results of the survey revealed that the primary vegetation in the area is Kikuyu grass. This dominant groundcover is a vigorous perennial that sends out long, strong runners and forms thick, dense mats. It has been widely planted by ranchers because it grows rapidly and withstands grazing and trampling very well.

Where rock outcrops occur and where grass cover has been disturbed or is thin, the vegetation appears in a greater variety of species including weed (herb) types. Char and Associates noted that in areas where there are deeper soils, there are large blocks of Eucalyptus and black wattle.

Scrub vegetation is found on the Kanaio end of the waterline corridor. In the 'a'a lava flow section, the scrub vegetation is sparse. In the rocky loam coarse sand soils section, the scrub vegetation is a mosaic of Christmas berry thickets and Kikuyu grass patches.

Only a very few native species are found within the Kikuyu grass pasturelands. The majority of native plants occur within the scrub vegetation. A list of the native species is presented in Table 4.

None of the native plants found within the project area are threatened or endangered, and none are species of concern.⁹ All of the plants in the study area can be found in similar habitats throughout the major Hawaiian islands. Further, it is noted that the Kikuyu grass, as well as the other identified vegetation, can quickly re-establish itself over disturbed areas caused by trenching and backfilling operations as would be employed by the proposed replacement waterline project.

TABLE 4. Native Plants Found Within Project Area

Common name	Scientific name	* Status
FERNS & FERN ALLIES		
'iwa'iwa	<i>Asplenium adiantum-nigrum</i>	I
'oāli'i	<i>Asplenium trichomanes subsp. densum</i>	E
pākahakaha, 'ēkaha 'ākōlea, pua'akuhinia	<i>Lepisorus thunbergianus</i>	I
kalamoho lau li'i, laukahi, kalamoho	<i>Pellaea ternifolia</i>	I
moa, moa nahele, pipi, 'o'o moa	<i>Psilotum nudum</i>	I
kīlau, kilau pueo, pai'ā	<i>Pteridium aquilinum var. decompositum</i>	E
'ōali	<i>Pteris cretica</i>	I
FLOWERING PLANTS		
DICOTS		
koa	<i>Acacia koa (planted)</i>	E
huehue, hue	<i>Cocculus orbiculatus</i>	I
'a'ali'i, 'a'ali'i kū makani	<i>Dodonaea viscosa</i>	I
koali 'awa, koali 'awahia	<i>Ipomoea indica</i>	I

⁹ Species of concern means that there is a need for more biological and/or taxonomic information regarding whether a species might need conservation actions in the future.

TABLE 4. Native Plants Found Within Project Area *(continued)*

Common name	Scientific name	* Status
FLOWERING PLANTS		
DICOTS <i>(continued)</i>		
'ōhi'a, 'ōhi'a lehua, lehua	<i>Metrosideros polymorpha</i>	E
olopua, pua, ulupua	<i>Nestegis sandwicensis</i>	E
'ūlei, u'ulei	<i>Osteomeles anthyllidifolia</i>	I
'ala'ala wai nui, ala'ala wai nui pua kī	<i>Plectranthus parviflorus</i>	I
'iliahialo'e	<i>Santalum ellipticum</i>	E
pōpolo	<i>Solanum americanum</i>	I?
pūkiawe, maiele	<i>Styphelia tameiameia</i>	I
'uhaloa, hi'aloa, kanaka loa	<i>Waltheria indica</i>	I?
'ākia	<i>Wikstroemia oahuensis</i>	E
MONOCOTS		
mānienie 'ula, pi'ipi, pilipili 'ula	<i>Chrysopogon aciculatus</i>	I?
	<i>Cyperus hillebrandii</i>	E
mau'u laiki	<i>Paspalum scrobiculatum</i>	I?

Status: E = endemic = native only to the Hawaiian islands.
 I = indigenous = native to the Hawaiian islands and elsewhere.
 I? = questionably indigenous = data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably indigenous.

3.8 Fauna

A faunal survey of the project area was conducted in October 2003 by Phillip L. Bruner, Environmental Consultant. Bruner recorded avifaunal species that were native, introduced, and migratory. Mammal species were also recorded.

The only native avifaunal species recorded was the short-eared owl (*Asio flammeus sandwichensis*), which is an endemic subspecies of owl and is relatively common on the slopes of Haleakalā. The short-eared owl is called Pueo in Hawaiian and serves as an amakua for many Hawaiian families.

The only other native birds that might occur in the area are the Maui 'amakihi (*Hemignathus virens wilsoni*) and 'apapane (*Himatione sanguinea*), both are not endangered. The endangered Hawaiian Goose or nēnē (*Branta sanvicensis*) occurs at higher elevations in the Haleakalā National Park.

The only migratory species recorded in the survey was the Pacific Golden-Plover (*Pluvialis fulva*). This species, which is not endangered, breeds in the arctic and winters in Hawai'i each year from August through April. The Golden-Plover is a shorebird, but generally is more commonly seen on lawns, pastures, and open habitats, such as agricultural fields. No other migratory shorebird, waterbird, or seabird was observed during the survey.

Introduced birds were most predominant during the survey. Sixteen species were identified. None are endangered and many are very common as indicated in Table 5.

TABLE 5. Introduced Birds

Common name	Scientific name	Relative Abundance
Cattle Egret	<i>Bulbucus ibis</i>	A
Gray Francolin	<i>Francolinus pondicerianus</i>	C
Black Francolin	<i>Francolinus francolinus</i>	U
Ring-Necked Pheasant	<i>Phasianus colchicus</i>	U
Spotted Dove	<i>Streptopelia chinensis</i>	U
Zebra Dove	<i>Geopelia striata</i>	A
Barn Owl	<i>Tyto alba</i>	U
Sky Lark	<i>Alauda arvensis</i>	A
Japanese White-eye	<i>Zosterops japonicus</i>	U
Northern Mockingbird	<i>Minus Polyglottos</i>	A
Common Myna	<i>Acridotheres tristis</i>	C
Red-Crested Cardinal	<i>Paroaria coronata</i>	C
Northern Cardinal	<i>Cardinalis cardinalis</i>	U
House Finch	<i>Carpodacus mexicanus</i>	C
House Sparrow	<i>Passer domesticus</i>	U
Nutmeg Mannikin	<i>Lonchura punctulata</i>	C

Notes: A = Abundant (100+)
 C = Common (50 to 100)
 U = Uncommon (1 to 50)

Source: *Avifaunal and Feral Mammal Field Survey of Upper Kula, Water System Replacement Project Lands, Maui*, November 3, 2003.

In addition to the avifauna species, mammals that were identified in the project area included axis deer (*Axis axis*), feral pigs (*Sus scrofa*), feral cats (*Felis catus*), rats (*Rattus spp.*) and mice (*Mus musculus*). The Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) occurs on Maui in low numbers and is listed as endangered. During the survey, no Hoary Bats were observed.

The proposed replacement waterline will not have a significant impact on area birds and mammals.

3.9 Climate

The climate in Upcountry Kula is characterized as moderately cool averaging in the high 70s°F during the summer days and high 50°F during the winter nights (Kula Sanatorium Station, elevation 3,004 feet).¹⁰ Precipitation is moderate with annual rainfalls averaging approximately 30 inches. Prevailing winds generally flow upslope on the western flank and laterally from the northeast on the southern flank of Haleakalā.

3.10 Hydrology

An unnamed intermittent stream, identified on the U.S. Geological Survey (USGS) map, traverses the northernmost section of the pipeline site. It extends more than 6.5 miles through the western flank of Haleakalā from the approximately 5,000-foot elevation to the shoreline. No other natural surface water feature occurs in the project area.

¹⁰ *Atlas of Hawaii, Second Edition*, Department of Geography, University of Hawaii, 1983.

The proposed project is located in the Kama'ole Aquifer System, where basal groundwater extends approximately 3 to 5 miles inland from the coast.¹¹ Further inland, the groundwater occurs as deep, high-level water in the Honomanū volcanics, a geologic feature associated with the original rift zone of Haleakalā.

Trenching to install the proposed replacement waterline is not expected to encounter the aquifer's groundwater resources.

3.11 Natural Hazards

As a dormant volcano, Haleakalā could still erupt at some time in the future. The last eruption occurred approximately 200 years ago along the mountain's lower southwest rift zone. This geologic section of the mountain traverses the 'Ulupalakua Water System and is potentially hazardous to the proposed replacement waterline.

Since the proposed project will be located predominantly on pasture lands and open fields, there is very little likelihood that it would be damaged from brush fire.

Damage from stormwater flooding is a possibility but would be minimal, if any, considering the underground placement of the waterlines. The aboveground storage tanks would be designed to tolerate high winds and withstand minor earthquakes.

3.12 Air Quality

There are no major air pollutant generators, including incinerators, quarries, manufacturing plants, and mass drying beds, in the region. The region is comprised primarily of grazing pastures, agricultural lands, and open space.

Installation of the replacement waterline will involve trenching and backfilling, pipeline fitting, installation of pressure breaker stations and valves, and construction of replacement water tanks. These activities, which will include the hauling of equipment and materials and movement of construction workers, are expected to generate dust, which in volume and duration are anticipated to be minor. Additionally, more than 92 percent of the proposed replacement waterline will be located in open fields away from residences and other occupied structures. There would be very little or no impact to area resident.

3.13 Acoustical Environment

Sources of major sounds in the open range and off-road areas are predominately winds blowing through vegetation foliage, outdoor activities in the observer's own party, and ranching-agricultural operations. 'Ulupalakua village is the only community settlement that occurs in the path of the replacement waterline project. Sounds from this small community are primarily from vehicles travelling on Kula Highway and the side roads that lead into the adjacent rural-residential properties. Overall, the area traffic is relatively light.

The dominant source of noise during project construction would be the construction equipment used in trenching and backfilling operations, installation of the replacement waterline, and replacement of the water tanks and pressure reducing valve stations. The contractor is likely to

¹¹ *Aquifer Identification and Classification for Maui: Groundwater Protection Strategy for Hawaii*, Technical Report No. 185, Water Resources Research Center, University of Hawaii, February 1990.

use backhoes, bulldozers, graders, rollers, pavers, generators, loaders, flatbed trucks, and dump trucks in its construction work. Some of this equipment, such as the backhoe, loader, roller and paver, would be employed only in the village area where the replacement waterline is expected to occur in the road shoulders or cross roads. For the most part however, the replacement waterline will be installed outside of the residential areas and the impacts from these sources are expected to be minimal.

During the operational stage of the project, the impact would be virtually zero, except when repair and maintenance work is performed. These operations are generally minor and do not generate significant noise.

3.14 Scenic Resources

The visual characteristics of 'Ulupalakua could be described as a large expanse of open, upland pasturelands, orchards, four-wheel drive ranch roads, and scattered rural homes. In the distance are views of the ocean, the islands of Lāna'i and Kaho'olawe, Kihei's shoreline, Maui's isthmus, and the West Maui Mountains.

The proposed replacement waterline will not interfere with these scenic views. The new waterline will be located underground and out of view. The aboveground accessory facilities, including the water tanks and pressure reducing valve stations, will be constructed in an unobtrusive and environmental sensitivity fashion. The water tanks will be small in size, located in a non-prominent area, and painted an unobtrusive color.

3.15 Archaeological Resources

An archaeological study was conducted by Cultural Surveys Hawai'i (CSH) in 2003.¹² It included a historical research of archival sources, historic maps, Land Commission Awards, and previous archaeological reports, as well as a field survey of surface archaeological features in the project area. The study indicated that the project area appears to have been heavily utilized in pre-contact times for permanent habitation and agriculture. Traditional sweet potato cultivation was later replaced by Irish potato cultivation and then ranching activities dominated into the present. Traditional sites may have been limited due to the continued utilization and reworking of the area lands over time.

Within the replacement waterline corridor, CSH found vast areas of pasture land, which as previously noted, are owned or operated by major ranching enterprises. Some areas were found to have cultural deposits including an area of agricultural terracing located along the Paeahu lateral line. These terraces were constructed with both linear and semi-circular stacked 'a'a boulder and cobble retaining walls, creating multiple level planting areas. The terraces within the complex may be of both pre-contact and historic origin and are evaluated under Criterion D (may be likely to yield information important to prehistory or history) of the State and National Register of Historic Places (NRHP).

Also recorded along the Paeahu lateral line corridor was a U-shaped structure constructed of stacked basalt boulders and cobbles. It is believed to be of pre-contact origin and is evaluated under Criterion D.

¹² Cultural Surveys Hawaii, Inc., February 2004.

In the Kanaio area of the replacement waterline corridor, numerous stone walls and clearing mounds related to ranching activities were found. These features are believed to be of historic origin and are evaluated under Criterion D.

The recommendations of the CSH study are that the central segment of the proposed Paeahu lateral alignment be re-aligned slightly to the south to avoid the agricultural terraces. The U-shaped structure appears to be in a safe location and would not be affected by the project.

The walls in the Kanaio area consist of many ranch-related stacked stone walls. These walls were observed to be previously breached by the existing waterline. Consequently, the study recommends that since these walls have been previously disturbed and there are many similar walls in the area that will not be affected, the new replacement waterline should be allowed to breach any ranch-related stone walls in its path. Additionally, care should be taken to minimize the impact to these walls by either routing the line over the walls or rebuilding the walls over the constructed pipeline.

3.16 Cultural Resources

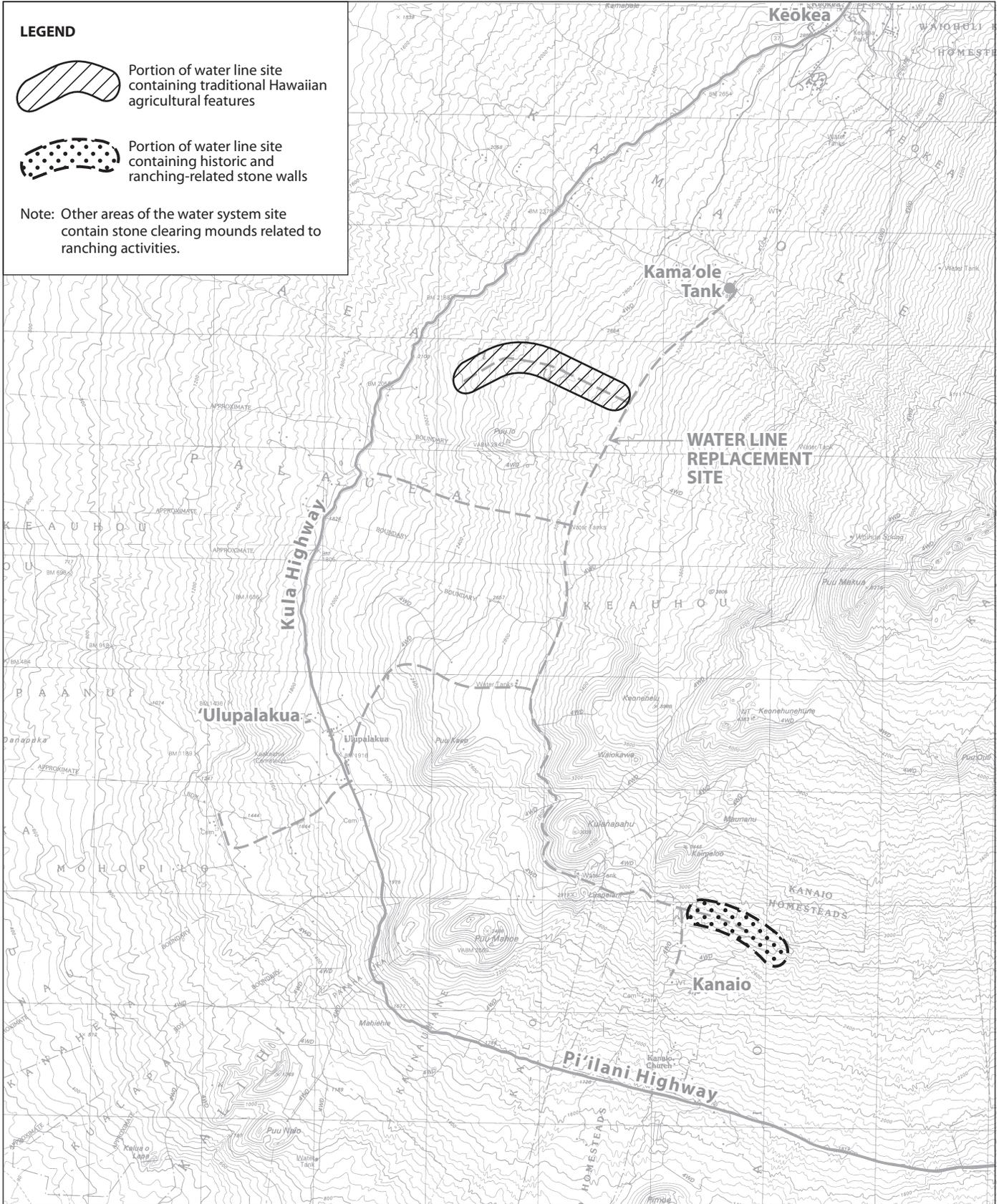
In evaluating the project's effect on cultural resources in the area, a cultural impact assessment was conducted by CSH.¹³ The study examined historic documents, Land Commission Awards, and historic maps, with the specific purpose of identifying traditional Hawaiian activities. Such activities would include the gathering of plant, animal and other resources, in addition to agricultural pursuits, as may be indicated in the historic records. The study also included a review of existing archaeological information pertaining to site distribution and a limited oral interview session with persons knowledgeable about the historic and traditional practices in the project area.

Results of the study indicate that during the early historical period, Kula's agricultural role was expanded as the introduction of whaling in 1820 and the California Gold Rush of 1849 created a demand for the Irish potato. The traditional 'uala planting grounds were now also used for the Irish potato, and the area became known as the "potato district." Immigrants from China came to Makawao during this time and created a thriving community in Kula. Sugar cultivation and ranching were introduced in Makawao in the early 1800s.

Many of the people who had claims in Kula had the chiefly status that allowed them to actively engage in the international economy, which were potatoes for cash. Kalepolepo flourished as a major entrepôt in the period from the 1830s to the mid 1870s.

The 1800s were marked by the continuation of ranching and sugar in Makawao. Lower Kula consisted primarily of pastureland by the end of the century. By the late 1800s, Hawai'i Commercial and Sugar Company became a major presence in Makawao with its absorption of other neighboring operations.

¹³ Cultural Surveys Hawaii, February 2004.



LEGEND



Portion of water line site containing traditional Hawaiian agricultural features



Portion of water line site containing historic and ranching-related stone walls

Note: Other areas of the water system site contain stone clearing mounds related to ranching activities.



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Figure 8
ARCHAEOLOGICAL SITES

'Ulupalakua Water System Improvements
East Maui, Hawaii

Polynesian introduced and endemic plant species in the project vicinity that are gathered for medicinal purposes, culinary use, and lei making, as noted by the cultural assessment interviewees include 'ōhelo (*Vaccinium spp.*), māmaki (*Pipturus spp.*), kukui (*Aleurites Moluccana*), and 'ōhi'a lehua (*Metrosideros polymorpha*) and a'ali'i (*Dodonaea viscosa*) flowers. Only the lehua and a'ali'i flowers were identified specifically in the study area by Char and Associates.¹⁴ Those interviewed for the study did not believe that the replacement waterline would have any negative effects on the availability of those plants or their ability to gather those plants.

The higher elevations of the Kula to Kanaio region are popular with local hunters for such game as pheasant, pig, and axis deer. Like the plant gathering practices, those interviewed for the cultural study did not believe the replacement waterline would have any negative effects on hunting practices.

Most traditional burial concerns by the interviewees centered around the Kanaio area makai of the Kula Highway near the old National Guard training grounds. The proposed replacement waterline will be located at the approximately 2,800-foot elevation above the highway.

Upon completion of the cultural impact assessment, CSH determined that there would be minimal to no impact on cultural resources within the project area. There were, however, some social concerns over the beneficiaries of the proposed project and what it may mean for the potential of housing development in the upland area and subsequent impacts on historic properties and traditional Hawaiian practices.

Although no specific cultural concerns were identified in the replacement waterline corridor, CSH is recommending that in the event inadvertent burials are encountered during the project construction, State law (Chapter 6E, Hawai'i Revised Statutes [HRS]) take effect and all construction work in the immediate area of the find cease operation, that the find remain in its place, and that the State Historic Preservation Division and County police department be immediately notified.

The County DWS recognizes the importance of cultural resources in the project area and intends to oblige to the recommendations of the archaeological and cultural consultant.

4 SOCIOECONOMIC SETTING

4.1 Socioeconomic Background of the Region

The Kama'ole-Kanaio area has had a long history of agricultural use. In 'Ulupalakua during the mid 1800's, the "Rose Ranch," established by Captain James Makee, produced sugar cane, but that operation did not last long. By 1879, sugar production ceased, the result of forest destruction above the sugar lands by cattle and other causes, which in turn reduced the total rainfall in the area making sugar unprofitable as an enterprise.

Meanwhile, ranching endured as a viable business and continued operations into the 20th century. Other agricultural ventures flourished and established themselves including various truck crops, floral nurseries, and a winery.

¹⁴ Char & Associates, November 2003.

Presently, 'Ulupalakua is in a stable socio-economic environment with a steady resident population. Homes in the area consist primarily of rural dwellings, country homes, and residences supporting ranching and other agricultural activities. The County's Makawao-Pukalani-Kula Community Plan does not project any notable expansion of existing populations in the area between Kēōkea and Kanaio. For the foreseeable future, any increase in water use would be primarily from pent-up demand by users who earlier did not have access to the area water supply, and by existing residents who now wish to expand or begin agricultural or ranching activities.

4.2 Economic Impacts Assessment

Completion of the proposed project will fulfill the need to replace and upgrade the existing 'Ulupalakua Water System to continually and adequately serve the Kama'ole-Kanaio community. These improvements will assure the continued economic benefits generated by ongoing agricultural and small business activities occurring in the region as well as government revenues from income, property, and sales taxes produced by such activities.

4.3 Social Considerations

The proposed action is not considered a land use that will generate direct social impacts. The purpose of the proposed action is to provide a utility that serves and supports land uses, such as residential, commercial, agricultural, public facilities, etc. No new source of water is being proposed and no expansion of service area is planned with this project. The primary intent of the proposed action is to replace an existing aging and outdated water system and to bring the existing infrastructure up to current DWS standards.

If any, the focus of public concerns regarding the project may be on construction impacts, particularly if there would be any fugitive dust, sedimentation from runoff, construction noise, water quality impacts on existing streams, etc. During the operational stage of the project, there would be primarily monitoring, maintenance, and repair activities to service the upgraded water system. These activities would have negligible negative effects.

5 PUBLIC FACILITIES AND SERVICES

5.1 Circulation and Traffic

Access to the 'Ulupalakua Water System is provided by Kula Highway and its connecting secondary roads, both public (County) and private (see Figure 9). Kula Highway is a State right-of-way that extends from the Haleakalā Highway – Kula Highway junction just above Pukalani to a point approximately four miles past the Kula Hospital and Clinic in Kēōkea. It then converts to a County road passing 'Ulupalakua and Kanaio before its identification changes to Pi'ilani Highway. In the 'Ulupalakua area, the highway has a posted speed limit of 15 to 25 miles per hour. Beyond Kanaio to the east, the narrow, rural right-of-way continues around Haleakalā to Kīpahulu and past Hāna where the right-of-way becomes Hāna Highway.

Paved roads provide access to the water system's northern terminus at Kama'ole Tank, Palaeua lateral at the system's western terminus, and 'Ulupalakua lateral at 'Ulupalakua village. Access to the remainder of the system is provided by unpaved jeep roads. Some of these roads are existing ranch roads and others were created to install, service, and maintain the pipelines.

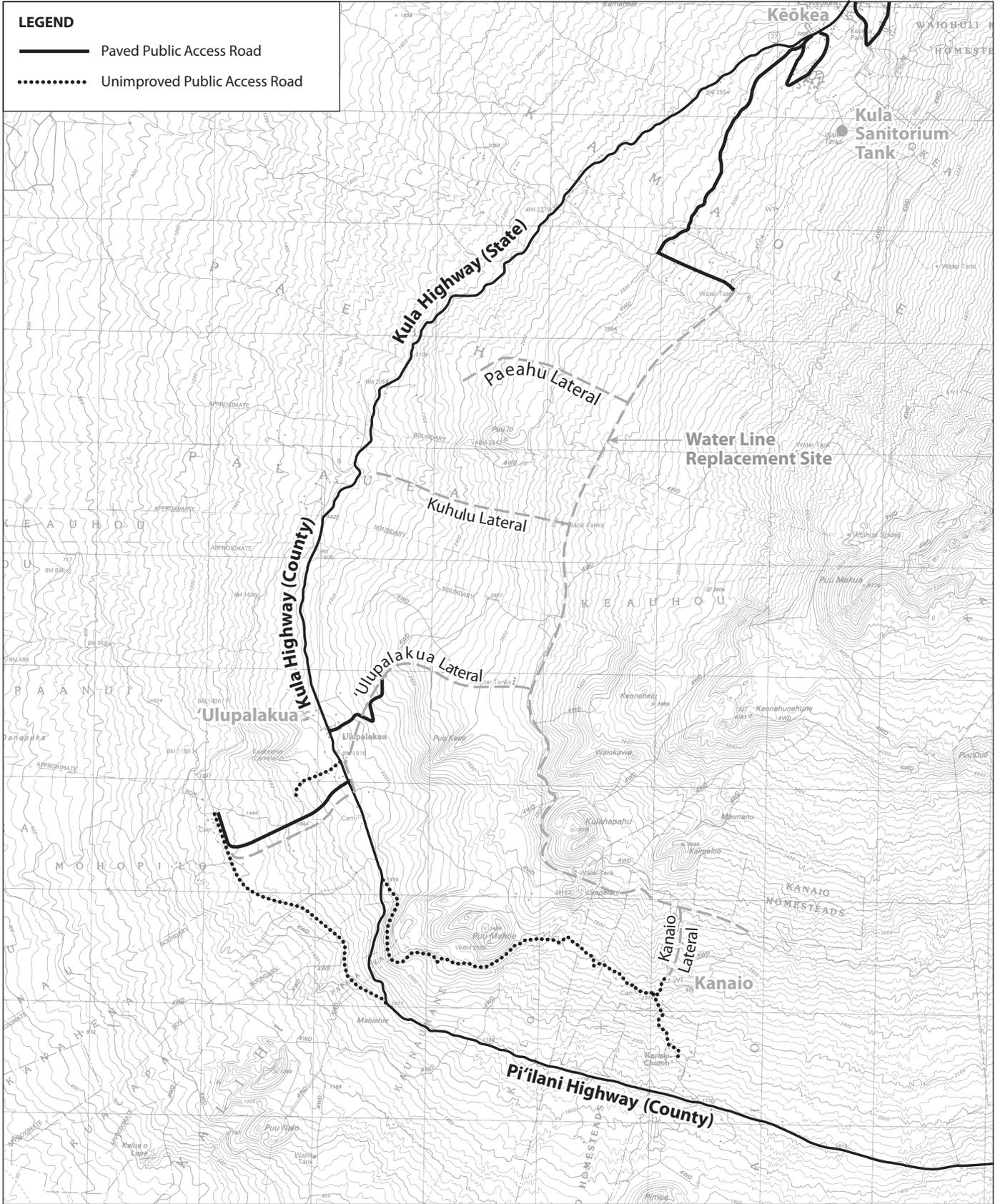


Figure 9
EXISTING CIRCULATION AND ACCESS

'Ulupalakua Water System Improvements
East Maui, Hawaii

A 24-hour traffic count was taken on Kula Highway between Thompson Road and Kealakapu Road in North ‘Ulupalakua by the State Department of Transportation. Results from the count, which was taken on April 28, 2009, show that a total of 1,375 vehicles traveled past the count station during that 24-hour weekday.

The morning peak hour on Kula Highway occurred between 8:00 a.m. and 9:00 a.m. with a count of 94 vehicles. The afternoon peak hour occurred between 4:30 p.m. and 5:30 p.m. with a count of 142 vehicles.

General observations by business and ranch personnel in ‘Ulupalakua village characterize the traffic on Kula Highway as light with higher volumes during the afternoon. There are no traffic signals in ‘Ulupalakua. Overall, the majority of traffic is comprised of tourist. In the afternoons, free and independent travelers (FITs) and tour vans are completing their trip around East Maui from Hāna with stops at the Tedeschi Winery and Ulupalakua Ranch Store. Recreational bicyclists, often touring in groups, also travel the highway.

5.2 Water, Sewer, Electricity, and Telephone

The water system that services the project area is the ‘Ulupalakua Water System. It is owned and operated by the County DWS which is presently proposing to replace and upgrade the system.

There is no public wastewater collection and disposal system in ‘Ulupalakua. Sewage disposal is accommodated predominantly by private cesspools.

Electrical power is supplied by Maui Electric Company Ltd. (MECO), while telephone service is provided by Hawaiian Telcom through overhead lines that generally follow existing rights-of-way. In the Kama‘ole-Kanaio area, these utilities do not particularly follow the alignment of the ‘Ulupalakua Water System. As previously described, the water lines in ‘Ulupalakua predominantly traverse open fields and pasture lands.

5.3 Solid Waste

Debris from site preparation and pipeline installation will be removed from the property and hauled away to a public landfill in Kahului. Construction is expected to generate very little solid waste.

Material excavated from the trenching operation will be used as backfill after the material is screened and sifted.

No solid waste is expected to be generated during the long-term operations of the replacement waterline, except for wastes produced from DWS repair and maintenance activities. The quantity of these wastes will be small and infrequent depending on the frequency of maintenance work.

5.4 Public Facilities and Services

The nearest County fire station is located in Kula, which is approximately 8.7 miles from ‘Ulupalakua village. There are no police substations in Upcountry Kula and no routine patrols in the ‘Ulupalakua area. Dispatches for police services are made on an on-call basis to the Maui County Police Headquarters in Wailuku, Maui.

Kula Hospital and Clinic is located a few miles from ‘Ulupalakua in Kēōkea and is available for long-term care patients. There are no emergency services at the facility. An ambulance operated

by an independent contractor is available at Rice Memorial Park for transport of emergency patients to the Maui Memorial Medical Center in Wailuku.

Other nearby public facilities include Kula Elementary School and a U.S. Post Office located approximately 1½ miles north of Rice Memorial Park.

6 RELATIONSHIP TO PUBLIC LAND USE POLICIES

6.1 Hawai'i State Plan

The Hawai'i State Plan was established by State law to serve as a guide for the future long-range development of the state. It is intended to identify the goals, objectives, policies, and priorities for the State government to: 1) provide a basis for determining priorities and allocating limited resources, such as public funds, services, human resources, land, energy, water, and other resources; 2) improve coordination of federal, state, and county plans, policies, programs, projects, and regulatory activities; and 3) establish a system for plan formulation and program coordination to provide for an integration of all major state and county activities.

The relevant objectives of the State Plan on water and the proposed 'Ulupalakua Water System improvements are:

- Assist in improving the quality, efficiency, service, and storage capabilities of water systems for domestic and agricultural use, and
- Support water supply services to areas experiencing critical water problems.

6.2 State Land Use Law

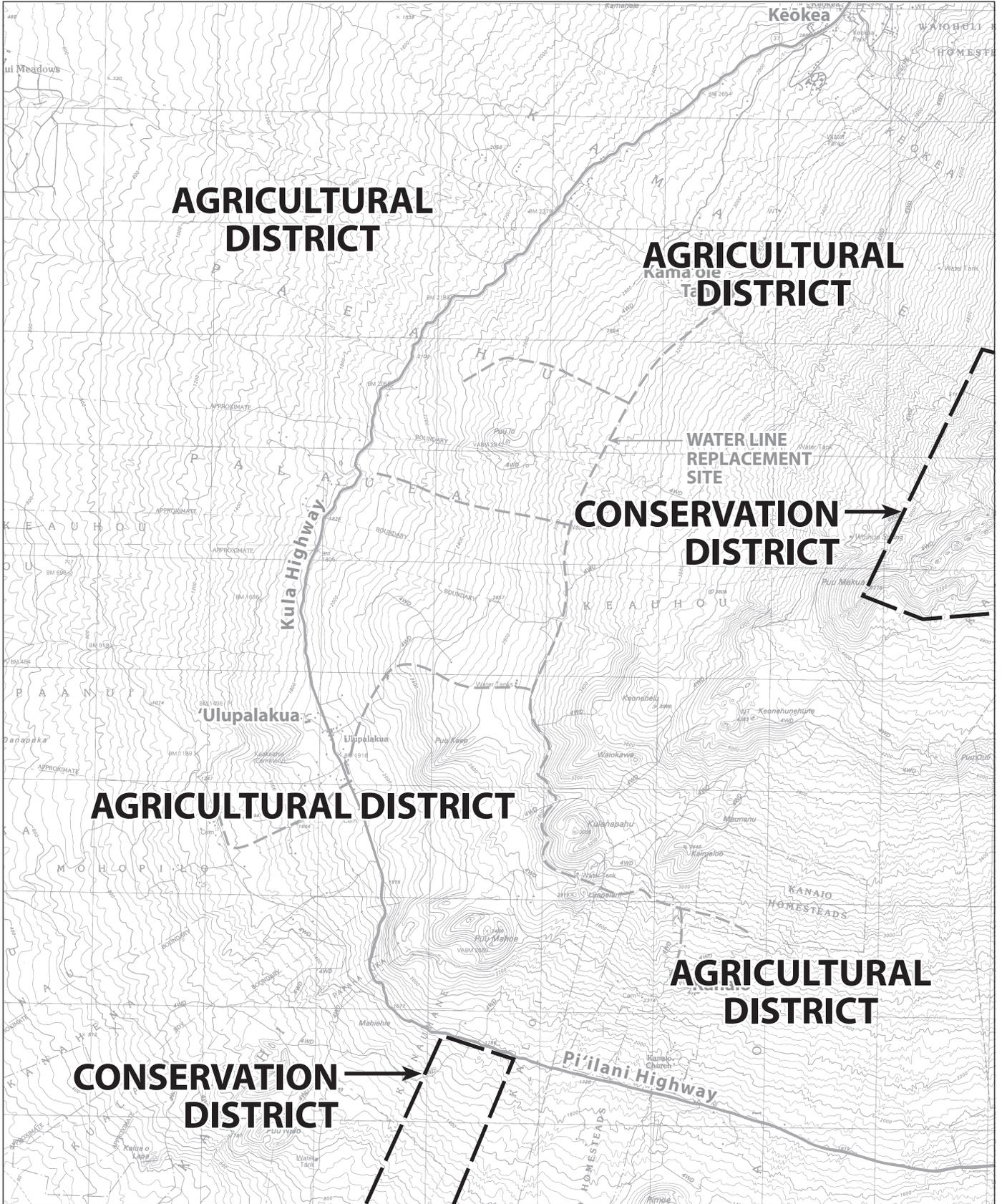
The State Land Use District Maps, administered by the State Land Use Commission, designate the water system site in the State Agricultural District (see Figure 10). The proposed action is a permitted use in this district.

6.3 State Environmental Policy

The proposed action is consistent with the State Environmental Policy, as stated in Chapter 344, HRS, to "enhance the quality of life" by "creating opportunities for the residents of Hawai'i to improve their quality of life through diverse economic activities which are stable and in balance with the physical and social environments." The proposed action will provide the necessary infrastructure to support such economic opportunities, allowing them to flourish and establish themselves in the County.

The following guidelines of the State Environmental Policy relate to the proposed project:

- Encourage management practices that conserve and fully utilize all natural resources.
- Encourage management practices that conserve and protect watersheds and water sources, forest, and open space areas.
- Protect endangered species of indigenous plants and animals and introduce new plants or animals only upon assurance of negligible ecological hazard.



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Figure 10
STATE LAND USE DISTRICTS

'UluPalakua Water System Improvements
East Maui, Hawaii

- Establish, preserve, and maintain scenic, historic, cultural, park and recreation areas, including the shorelines, for public recreational, educational, and scientific uses.
- Promote and foster the agricultural industry of the state; and preserve and conserve productive agricultural lands.

6.4 Maui County General Plan

The General Plan of the County of Maui was updated and adopted by the County in 1991. It was later amended by Ordinance No. 2234 which became effective in 1993. This plan is now the current long-range planning document for the County. Notably, the General Plan again is being updated and is presently in draft form undergoing public review.

According to Section 8-8.5 of the Maui County Charter, the General Plan shall “recognize and state the major problems and opportunities concerning the needs and the development of the county and the social, economic and environmental effects of such development and shall set forth the desired sequence, patterns and characteristics of future development.”

The proposed action is consistent with the current County General Plan. The objectives of the General Plan regarding water are:

- To provide an adequate supply of potable and irrigation water to meet the needs of Maui County’s residents.
- To make more efficient use of our ground, surface and recycled water sources.

The key policies of the General Plan regarding water in the ‘Ulupalakua area are:

- Support the improvement of water transmission systems to those areas that historically experience critical water supply problems, provided the improvements are consistent with the water priorities and the County’s Water Use Development Plan provisions for the applicable community plan area.
- Meet or exceed federal quality standards for the potable water supply.
- Develop improved systems to provide better fire protection.
- Support expeditious action on legislation providing replacement of inadequate water transmission systems.
- Maximize use of existing water sources by expanding storage capabilities.

6.5 Makawao-Pukalani-Kula Community Plan

Adopted in 1996, the Makawao-Pukalani-Kula Community Plan provides a planning document that guides government actions and decision-making in the region through the year 2010. It provides specific recommendations to address the goals, objectives, and policies contained in the Maui County General Plan.

In identifying the key problems in the region, the community plan states that a primary concern, in terms of water, is the limited development of water resources and distribution system to meet the needs of the region. The proper allocation of water resources is considered essential to (in order of priority):

- (1) preserve agriculture as the region's principal economic activity, promote diversified agricultural activities, and effectively encourage the development of Department of Hawaiian Home Lands (DHHL) parcels; and
- (2) ensure the long-term viability of the region's residential and economic base.

The proposed action is consistent with the goals, objectives, policies, and implementing actions of the Makawao-Pukalani-Kula Community Plan. The goal of the Community Plan on physical infrastructure is to provide timely and environmentally sensitive development and maintain infrastructure systems that protect and enhance the safety and health of the Upcountry residents and visitors, including the provision of domestic water, utility and waste disposal services, and effective transportation systems which meet the needs of residents and visitors while maintaining the region's rural character.

The key objectives and policies of the Community Plan on water are:

- Restrict the use of any water developed within or imported to the Upcountry region to consumption within the Upcountry region, with the exception provided for agricultural use.
- Seek expanded municipal withdrawal from the lowest cost source to serve the Upcountry region.
- Support the development of separate domestic and irrigation water systems.
- Encourage the construction of additional storage capacity by DWS, commercial developers, and individual farmers to help alleviate the inadequate water supply.
- Encourage cooperative efforts among federal, state, and county agencies, and developers to ensure that water storage and delivery needs of the region are met in a timely and orderly manner.

The key implementing actions of the Community Plan on water for 'Ulupalakua are:

- Increase catchment efficiency and storage capacity on the Upper Kula line to achieve 4 million gallons per day (mgd) sustained delivery to farms and residences.
- Systematically improve and upgrade the existing water delivery system.

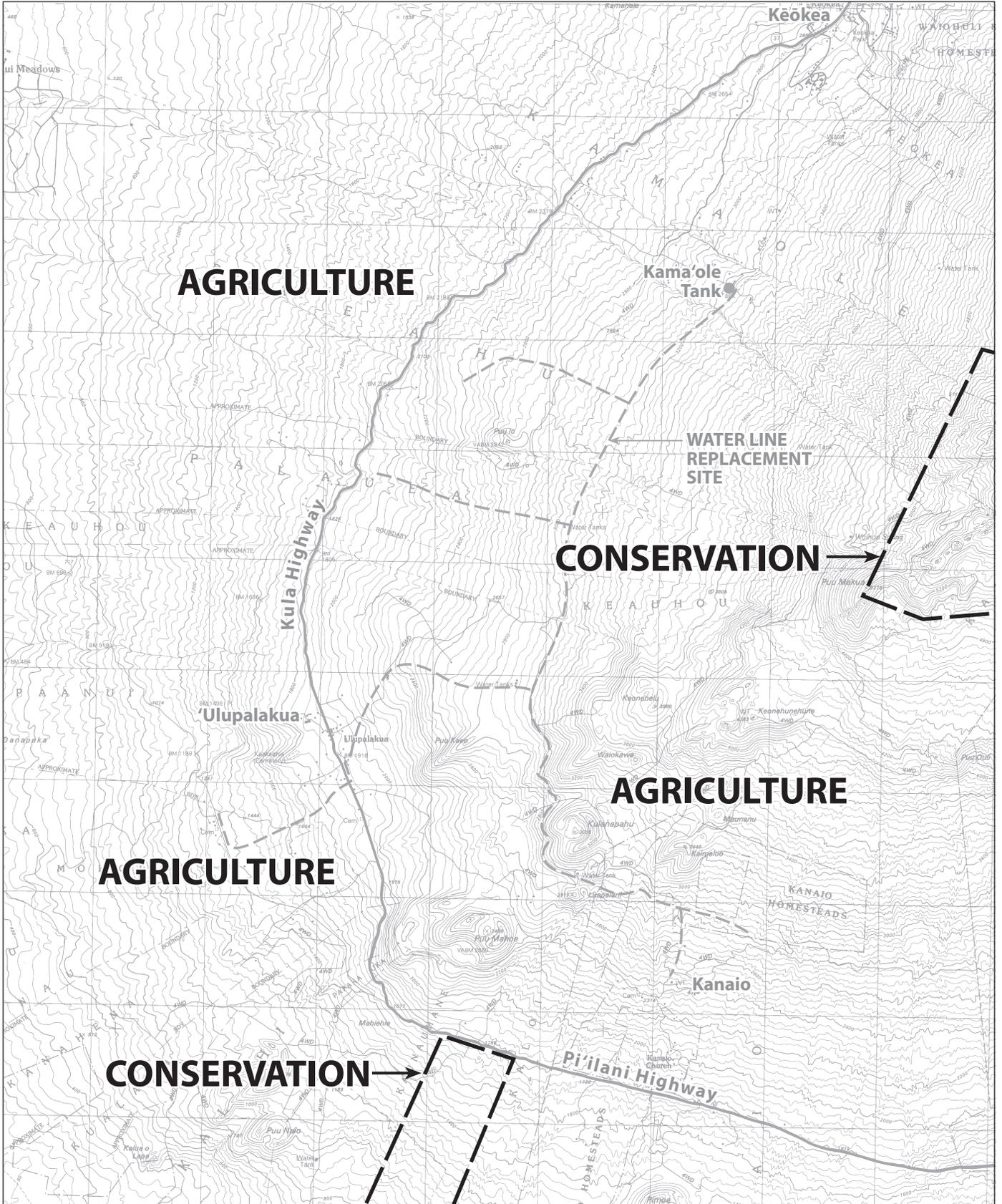
The land use designation for the project area is Agriculture (see Figure 11). In 'Ulupalakua, a small area is designated Business/Commercial for the village center. The community plan's implementing action recommends that the commercial sites for, and adjacent to, the Ulupalakua Ranch Store and the Tedeschi Winery be zoned for Country-Town Business.

6.6 Maui County Zoning

In accordance with the County Comprehensive Zoning Ordinance, the proposed replacement waterline is located in the Makawao-Pukalani-Kula Project District 1. The County zoning for the project area is Agricultural. Water transmission lines and their ancillary facilities are defined as "utility facilities, minor" and are permitted in any of the County's zoning districts.

6.7 Special Management Area

The project site is located more than 10,000-feet mauka of the Special Management Area (SMA) of the County of Maui. An SMA Use Permit is not required for the proposed action.



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Figure 11
MAKAWAO-PUKALANI-KULA COMMUNITY PLAN

'UluPalakua Water System Improvements
East Maui, Hawaii

6.8 Required Permits and Approvals

Although the replacement waterline will cross an intermittent stream, no portion of the pipeline or support structure will be placed within the watercourse. Hence, no Department of the Army Permit or Stream Channel Alteration Permit will be required.

Since the project construction will involve clearing, excavation, backfilling, grading, and hydrotesting, a National Pollutant Discharge Elimination System (NPDES) general permit coverage from the State DOH is anticipated for the project.

In relation to the State and County land use regulations, the proposed action is compatible with the State Land Use District law, Maui County General Plan, Makawao-Pukalani-Kula Community Plan, and County zoning.

Located outside of the SMA, the proposed action will not require an SMA Use Permit from the County of Maui.

Before construction can begin, DWS will be required to obtain a building and grading permit from the County Department of Public Works.

6.9 Compliance with the State of Hawai'i Drinking Water State Revolving Fund (DWSRF) Program Requirements

As previously described, this project may be funded, in part, by federal funds through the State of Hawai'i's DWSRF Program. The DWSRF Program was established to promote projects that help prevent contamination through source water protection and enhanced water system management. This EA includes the environmental information required for compliance with the DWSRF Program.

6.9.1 Cross-Cutting Federal Authorities

The following addresses the proposed project's relationship to the federal "cross-cutting" authorities.

6.9.1.1 Archaeological and Historic Preservation Acts

An archaeological study was conducted in the project area and its findings and recommendations are that the proposed action is consistent with the Archaeological and Historic Preservation Act of 1974, as amended. Archaeological features were identified in the replacement pipeline corridor, primarily agricultural terraces, u-shaped stone structure, and stone walls and clearing mounds related to ranching activities. All are believed to be of pre-contact or historic origin and were evaluated under Criterion D (may be likely to yield information important to prehistory or history) of the State and National Registers of Historic Places.

In an effort to minimize any impact to these sites, DWS is realigning a section of the proposed replacement waterline, but will stay within the same general utility corridor. Additionally, DWS acknowledges that should any potential archaeological feature be uncovered during project construction, all work in the immediate area will be halted and a project archaeologist called to the site to evaluate the find and make recommendations to the State Historic Preservation Officer (SHPO) of the DLNR. The SHPO will determine what is necessary to mitigate any impacts before construction is permitted to proceed again.

6.9.1.2 Clean Air Act

The U.S. Environmental Protection Agency (EPA) compares concentrations of criteria pollutants to established National Ambient Air Quality Standards (NAAQS) in order to characterize air quality. The State DOH has established ambient air quality standards similar to the NAAQS. Criteria pollutants at the national level include carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter, ozone (O₃), and lead (Pb). Based on ambient air monitoring data, the EPA has classified the island of Maui and the state as being in attainment of the federal standards. Pollutant concentrations within the islands also comply with the more stringent State standards.

The proposed replacement waterline will not have long-term emissions. Short-term construction-related emissions however, such as those from fugitive dust, would be generated and subject to compliance with the provisions of Hawai'i Administrative Rules (HAR) 11-60.1. These State provisions control emissions of substantial size and require that fugitive dust be minimized. Hence, no significant impact on air quality is expected to occur.

6.9.1.3 Coastal Zone Management Act

The Hawai'i Coastal Zone Management (CZM) Program was promulgated in 1977 as a result of the federal Coastal Zone Management Act of 1972. Jurisdiction of the CZM Program encompasses the entire state including its coastal waters. Its policies on the environment relate to recreational resources, historic resources, scenic and open space resources, coastal ecosystems, economic uses, coastal hazards, managing development, public participation, beach protection, and marine resources.

Other elements of the program include: a permit system to control development within the SMA and Shoreline Setback Area; a Hawai'i Ocean Resources Management Plan to provide a comprehensive, integrated ocean policy and management framework for Hawai'i's marine waters; and a Federal Consistency program that requires all federal activities, permits, and financial assistance to be consistent with the Hawai'i CZM Program.

At the approximately 3,000-foot elevation of Haleakalā, the proposed project is located more than two miles from the shoreline. The resort communities of Kīhei, Wailea, and Mākena are along the coast. The proposed action will not involve the removal of material, erection of a structure, or placement of new features on or near the coastline. It will not interfere with any existing beach accesses, negatively affect significant historic and prehistoric resources, obstruct coastal scenic and open space resources, or impair valuable coastal ecosystems. The proposed project will include opportunities for public participation, via the provisions of Chapter 343, HRS, and allow State implementation of its ocean resources management program. The proposed action is consistent with the objectives and policies of the Hawai'i CZM Program.

6.9.1.4 Endangered Species Act

Findings from the project's botany and fauna studies indicate no endangered or threatened species occupy or inhabit the proposed waterline site (see Appendices B and C).

6.9.1.5 Environmental Justice, Executive Order 12898

The project site is located in a remote area of Haleakalā occupied primarily by ranching and agricultural activities. Human occupation is few and sparse. There may be less than 180 families

in the Kama'ole-Kanaio area and virtually all will be affected by the proposed water system improvement. It is unlikely that no resident is connected to the system, since the cost of developing a high-level private well for personal use would be prohibitive. State Division of Water Resource Management records presently show no private wells in the area.

All customers, whether a minority or majority in the region or whether high-income, middle-income, or low-income, will benefit from the improved water system.

The alignment of the replacement waterline will be in the same general alignment as the existing line. The replacement waterline, in most part, will be in the open pasturelands above the highway and will not displace any residences or business operations. Where the waterline traverses 'Ulupalakua village, it will be placed within existing rights-of-way or roadway corridors. The underground location of the waterline will minimize the impact on views and the physical environment. The new water tanks and pressure reducing valve stations, which are the only aboveground features in the system, will be strategically located to minimize any effects on the human environment.

6.9.1.6 Floodplain Management, Executive Order 11988

Located at the approximately 3,000-foot elevation of Haleakalā more than two miles from the shoreline, the proposed project is not subject to potential coastal flooding. Further, the Federal Emergency Management Agency's Flood Insurance Rate Map (FIRM) for 'Ulupalakua, shows neither 100-year riverine flooding nor detailed studies of potential riverine floodways in the project area.

6.9.1.7 Protection of Wetlands, Executive Order 11990

Findings from the project's botany and fauna studies indicate that there are no wetlands along the proposed replacement waterline alignment. The project site is primarily in pasture and open space use and comprised of well-drained soils. Since there are no wetlands along the project alignment, no alternative route is necessary.

6.9.1.8 Farmland Protection Policy Act

The proposed action calls for the construction and operation of a waterline system across large tracts of ranch lands. Installation of the replacement waterline will occur in segments in a progressive fashion along the planned alignment. Once construction is completed, the underground pipeline will be unnoticed by the ranches. Only the aboveground water tanks and pressure reducing valve stations, each of which would occupy less than 15,000 sq. ft. of land, would be noticed. Additionally, the size of the project site in comparison with the size of the surrounding ranch lands will be extremely small and would result in negligible effect on any ranching operations.

6.9.1.9 Fish and Wildlife Coordination Act

The proposed action will not result in the alteration of any stream or natural water feature or impacting any critical wildlife habitat. The U.S. Fish and Wildlife Service and the State DLNR were requested to comment on the proposed action during the project's early consultation process. No comments were received, but the agencies will be asked to comment on the proposed action again during the Draft EA's 30-day public comment period.

6.9.1.10 National Historic Preservation Act

Although one section of the project area contains traditional Hawaiian agricultural features and another area contains historic-period stone walls, none of the sites are deemed significant or worthy of being designated on the NRHP.

6.9.1.11 Safe Drinking Water Act

The Safe Drinking Water Act is the primary federal law that ensures the acceptable quality of our drinking water. Under this Act, the EPA sets standards for drinking water quality and oversees the states, local municipalities, and water suppliers, who implement those standards. The Act requires all public water systems to meet stringent water quality standards.

One of the purposes of the proposed project is to upgrade the existing water system in 'Ulupalakua to meet current DWS standards. This calls for DWS to conform with the provisions of the Safe Drinking Water Act and the State DOH water quality standards for drinking water.

The DWS is not developing a new source of water for the system but is simply delivering water to its customers through new reliable pipelines. The source of this existing water is the surface waters in the Waikamoi Rain Forest. A water treatment facility, located several miles to the south of the source, treats the supply to meet the current State and federal standards for potable water.

During the project's construction phase, the replacement waterline will be hydrottested. This procedure will include a leakage test and disinfection application following the County's DWS Water System Standards. Discharge of the hydrottest waters will comply with DOH's NPDES requirements.

Similar to the replacement waterlines, the proposed supplemental water tanks will be cleaned, tested for leaks, and disinfected according to DWS's Water System Standards.

6.9.1.12 Wild and Scenic Rivers Act

There is only one stream that is identifiable in the project area. It is shown on the USGS map as an unnamed stream. The watercourse is intermittent and is not listed on the National Wild and Scenic River System.

As discussed in a previous section of this document, the proposed action will not result in any direct contact with the watercourse nor negatively affect any flow in the channel. The proposed action, hence, will not violate the objectives of the Wild and Scenic Rivers Act.

7 SUMMARY OF MAJOR IMPACTS

7.1 Construction Methodology and Impacts

Heavy equipment will be used during the installation of the replacement waterline, water tank replacements, and pressure reducing valve stations. Installation of the replacement waterline will require excavation of trenches, measuring approximately 2 to 3 feet wide and 4 to 6 feet deep, placement and fitting of the pipeline, and backfilling. Approximately 460 cubic yards of material would be excavated per 1,000 feet of trenches. The replacement waterline will be laid in the ground without a concrete base or cover. The excavated material will be temporarily stored

adjacent to the trench and later placed back as backfill after the pipeline has been laid and the excavated material screened and sifted.

Installation of the replacement waterline will require little clearing of vegetation. The waterline corridor traverses predominantly open fields and pasture lands. It does not cross any critical habitat of rare, threaten or endangered plant or wildlife species. Existing fauna in the area are common and extremely mobile. They are expected to occupy other sites in the vicinity during construction and return to the project area after construction is completed.

Construction will involve the use of heavy vehicles and equipment such as flatbed trucks, backhoes, loaders, dump trucks, boom-mounted trucks, dozers and graders. During this operation, fugitive dust, emissions from construction equipment, and noise will be generated. Groundwater will not be encountered during excavation of the trenches. Construction equipment will be stored on site to minimize mobilization on local roadways between the construction yard and project site.

Potential runoff from the construction site to adjacent occupied areas may occur during heavy rainfall. Hence, runoff erosion control measures will be employed, where necessary. Specific measures are discussed in the next section, entitled Proposed Mitigation Measures.

7.2 Operations and Impacts

The proposed action calls for permanent ground fixtures that do not have any active operational activities except for periodic monitoring and maintenance. Project impacts would be primarily visual and minor in scale since the predominant element of the upgraded water system will be underground.

During the operational stage of the project, surface runoff from the project site will be very similar to conditions that existed prior to construction. No changes in drainage patterns or runoff volumes are anticipated.

8 PROPOSED MITIGATION MEASURES

Mitigation measures will be employed by the construction contractor to insure that the least amount of project impacts occur on the environment. To address potential runoff and sedimentation that might occur to adjacent streams, watercourses, natural areas, and inhabited sites during construction, the contractor will develop a best management practices (BMP) plan for County approval as part of the project's grading permit application process. The plan will describe how on-site generated runoff and sediment movement will be controlled and prevented from entering other properties and how the applicant will implement the plan. A grading permit will not be issued unless the applicant meets all of the grading standards that are designed to safeguard life and limb, protect property, promote public welfare, and to preserve and enhance the natural environment, including but not limited to water quality.

Potential mitigation measures for controlling runoffs and sediment movement include the development of sedimentation basins, cut-off swales and ditches, rock filter berms, hydromulching and wattles. These will be included in the BMP, which will be subject to the approval of the County.

Since more than 92 percent of the project site is located in open fields away from any residences or inhabited structures, implementation of mitigation measures will be concentrated in small

sections of the project area. Additionally, there is only one watercourse of note that traverses the replacement waterline site. Possible mitigation measures that could be employed include the use of setbacks from the watercourse for construction and mobilization activities and for temporary equipment and supply storage.

No groundwater is expected to be encountered during trenching operations, hence it would not be necessary to address concerns regarding discharge to state waters.

In order to control fugitive dust generated by earthwork at the construction site, mitigation measures such as the erection of dust screens, covering of dirt stockpiles, and sprinkling of water on exposed dirt areas, may be employed. Only a small portion of the project site is located near occupied areas. As a result, mitigation measures may be necessary for only a portion of the total project.

Construction noise should not be a significant source of impact in the open fields and pasture lands. There will be no construction in the evenings or at night. In 'Ulupalakua village, precautions will be taken to maintain a low profile operation. Project activities will comply with the Administrative Rules of the DOH, Chapter 11-46, Community Noise Control. Compliance with the DOH regulations will be part of the project's construction contract and responsibility of the selected contractor.

According to CSH, all necessary archaeological fieldwork in the project area is considered complete. The alignment for the Paeahu replacement lateral can be shifted slightly to the south to avoid archaeological features. By revising this service lateral location, no further archaeological work would be necessary for the project.

All solid waste or debris generated within the project area during construction will be collected and hauled away from the property to a public landfill or authorized commercial disposal site.

9 ALTERNATIVES CONSIDERED

9.1 No Action

If no action occurs on the project site and existing conditions and operations are allowed to continue as they have, the present pipeline will progressively deteriorate and will likely have an increased frequency of line breaks or leakages. This would result in a loss of water or water pressure and a disruption in water service to area residents and ranchers. It would also result in more frequent repairs and maintenance work for DWS when resources could otherwise be used for improved services elsewhere.

Additionally, the limited size of the waterline and extended line length reduces the efficiency of the system to deliver water to its users. This is problematic when fire emergencies occur, and when there is a higher demand for water during droughts or dry spells.

In the long-term, when more users are on-line, public pressure will demand that the small line size be upgraded.

9.2 Facsimile Pipeline Replacement

Replacement of the existing waterline at grade with a similar size and type of line will not resolve any of the problems that currently face DWS. Although the waterline will be new and

have less likelihood to deteriorate at a rapid rate, frequently break, or leak, there would still be a problem with exposure to surface hazards, loss of pressure in the line, and limited line capacity.

The location of the replacement waterline along the general alignment of the existing line will reduce or minimize the impact on adjacent land uses. It would also utilize an existing service/maintenance road.

In the long-term, the increase in demand for water in the region will continue to be constrained by the limited capacity of the system. Under community pressure to accommodate increased demand, DWS would be compelled to upgrade its 'Ulupalakua system thereby expending a large sum of additional money on the same system in a short period of time. These short-term repeated upgrades would benefit the construction industry and the economy, but would be inefficient use of public funds by the agency.

9.3 Alternative Alignment

An alternative alignment for the replacement waterline would be unfeasible. Although an alternative alignment may have a more direct route to its destination and would save on facility cost over the entire system's length, the alignment would stray away from existing utility corridors and result in impacting new lands and land uses. This would raise environmental concerns and issues that potentially could be irresolvable.

The existing line has been laid with rationale following a route that connects source and end users in a most efficient manner. It uses the terrain to provide the desired pressure and necessary flow by gravity. Auxiliary equipments are used to reduce the build-up of excessive pressure in the system and distribute water at a safe and adequate rate.

The location of the replacement waterline along the general alignment of the existing system will allow DWS to use existing access roads for construction of the new pipeline. In the long-term, the same roads could be used to maintain and service the replacement system.

9.4 New Source at South Terminus

A new source of water could be developed around 'Ulupalakua or Kanaio to feed the Upper Kula System from the south. Line sizes would be upgraded only at the far southern terminus of the system replacing the existing 2-inch and 4-inch lines with an 8-inch line. The far northern section of the 'Ulupalakua Water System is already outfitted with an 8-inch line. The benefit of this alternative would be the cost savings from improving only a portion of the waterlines in lieu of the entire system.

Although this alternative would appear to cost less than to replace the entire waterline system, the cost of developing and outfitting a well would add approximately \$2.5 million to the total project cost. This additional expense would include a storage tank and booster pump in addition to the production well to pressure feed the lower (southern) end of the water system. Overall, these new facilities could raise the cost of this alternative above the cost of replacing the entire system.

Successful sources of water are located on the wet northern flank of Haleakalā. The dryer southern and southwestern flanks are unproven and the odds of developing potable water in this region are low.

As records show, ample water is available from the rain forests on Haleakalā's north flank. A distribution system is already in place to deliver the water to the 'Ulupalakua region. However, upgrades and improvements will be required, particularly to line size and accessory facilities, to meet current standards for bringing adequate water and providing reliable service to the area.

10 ANTICIPATED DETERMINATION

This Draft EA demonstrates that the proposed action will have no significant adverse impact on the environment and that an Environmental Impact Statement (EIS) is not warranted. A FONSI, therefore, is anticipated for this project.

11 FINDINGS AND REASONS SUPPORTING THE ANTICIPATED DETERMINATION

The following findings and reasons indicate that the proposed action will have no significant adverse impact on the environment based on the 13 significance criteria provide in HAR 11-200-12, and as a result support the above anticipated determination.

- *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource.* Alternative designs were considered to provide the best solution for replacing the waterlines in the 'Ulupalakua Water System without creating an irrevocable commitment to significant loss or destruction of the area's natural resources. An archaeological monitoring plan will be prepared prior to installation of the waterline and will be implemented during project construction to ensure that no significant archaeological feature or cultural resource is adversely affected.
- *Curtails the range of beneficial uses of the environment.* The proposed action calls for the replacement of existing waterlines in the 'Ulupalakua Water System. No new uses are planned. The proposed action does not require changes that would curtail the range of beneficial uses of the environment.
- *Conflicts with the state's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders.* As demonstrated in this document, the proposed action is consistent with the State's long-term environmental policies and guidelines as expressed in Chapter 344, HRS.
- *Substantially affects the economic or social welfare of the community or state.* The proposed action is expected to sustain and improve the positive economic effects that a utility provides to a community. Moreover, the construction activity associated with the proposed action will mobilize jobs and infuse business and personal income into the local economy. No negative effects on the social welfare of the local community are anticipated.
- *Substantially affects public health.* The proposed action will not result in the use of hazardous materials or employ a construction methodology that would be detrimental to the public health and safety of the area residents. Existing State DOH regulations are in effect to protect air and water quality in Hawai'i. Construction noise will be minimized through compliance with HAR Chapter 11-46, Community Noise Control.

- *Involves substantial secondary impacts, such as population changes or effects on public facilities.* There will be no significant adverse social impact generated by the proposed action. The waterline project will not change existing land uses nor generate undue increase in resident population. It will not result in significant long-term negative impacts on traffic nor overburden existing public facilities and services.
- *Involves a substantial degradation of environmental quality.* The proposed action will not involve extensive grading in any concentrated area or alteration to the area's overall drainage pattern. No long-term degradation of the natural environment is anticipated.
- *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger actions.* This environmental assessment covers the entire water system that is proposed for replacement. Due to budgetary constraints however, only a portion of the project will be constructed as this time. When funds become available, subsequent phases of the project will move forward. This EA has considered the total waterline project, its affected environment and associated probable impacts.
- *Substantially affects a rare, threatened, or endangered species, or its habitat.* No federal- or State-listed rare, threatened, or endangered wildlife or flora species will be negatively affected.
- *Detrimentially affects air or water quality or ambient noise levels.* The anticipated impacts associated with project construction, such as dust and noise, are short-term and temporary. These impacts would be minimized by the implementation of mitigation measures in accordance with applicable laws, statutes, ordinances, and rules and regulations of the federal, state, and county governments. Erosion and sedimentation control measures and BMPs will be implemented to prevent construction-related runoff from impacting adjacent properties and water resources.
- *Affects or is likely to suffer damage by being located in an environmentally sensitive area such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters.* The waterline site is located more than two miles from the shoreline. Coastal hazards will not impact the project. Although the project area is subject to periodic heavy rainfall, severe stormwater runoff is not a hazard for the proposed underground replacement waterline.
- *Substantially affects scenic vistas and viewplanes identified in county or state plans or studies.* The proposed action consists primarily of an underground waterline that will not disrupt existing view corridors.
- *Requires substantial energy consumption.* The proposed action does not require energy consumption during its operations.

12 REFERENCES

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13 APPENDICES

- A. Letters Received During Early Consultation Period.

- B. Botanical Resources Assessment, 'Ulupalakua Water System Improvements, Makawao District, Maui.
- C. Avifaunal and Feral Mammal Field Survey of Upper Kula Water System Replacement Project Lands, Maui.
- D. Archaeological Assessment in Support of the 'Ulupalakua Water System Replacement Project Kama'ole, Paeahu, Palauea, Keauhou, Papa'anui, and Kanaio, Makawao (Kula and Honua'ula) District, Maui.
- E. Cultural Impact Assessment in Support of the 'Ulupalakua Water System Improvements Kama'ole, Paeahu, Palauea, Keauhou, Waipao, Papa'anui, and Kanaio, Makawao (Kula and Honua'ula) District, Maui.

APPENDICES

APPENDIX A

LINDA LINGLE
Governor



RECEIVED

SANDRA LEE KUNIMOTO
Chairperson, Board of Agriculture

DIANE LEY
Deputy to the Chairperson

2003 NOV -4 PM 1: 42

State of Hawaii
DEPARTMENT OF AGRICULTURE
1428 South King Street
Honolulu, Hawaii 96814-2512

BELT COLLINS HAWAII

November 3, 2003

Mr. Glenn Koyama
Belt Collins Hawaii Ltd.
2153 North King Street, Suite 200
Honolulu, Hawaii 96819

Dear Mr. Koyama:

RE: EA for Proposed Water Line Replacement Kamaole Tank

Thank you for the opportunity to provide comments on the above project. At this time, the Department of Agriculture does not have any infrastructure in the area, however, we would be interested in tracking the progress of this project for possible future need.

Sincerely,

A handwritten signature in cursive script, appearing to read "Brian Kau".

Brian Kau, P.E.
Administrator and Chief Engineer
Agricultural Resource Management Division





December 22, 2003
2002.72.0100 / 03P-345

Mr. Brian Kau, P.E.
Administrator and Chief Engineer
Agricultural Resource Management Division
Department of Agriculture
State of Hawaii
1428 South King Street
Honolulu, HI 96814-2512

Dear Mr. Kau:

**Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

Thank you for your letter of November 3, 2003 responding to our preconsultation notice to prepare an Environmental Assessment for the water line replacement in Ulupalakua, Maui. When the Draft EA is completed, we will transmit a copy to you for further review and comment.

Thank you for your participation in this review process.

Sincerely yours,

BELT COLLINS HAWAII LTD.

A handwritten signature in black ink that reads "Glen T. Koyama".

Glen T. Koyama

Honolulu
Guam
Hong Kong
Philippines
Seattle
Singapore
Thailand

GTK:lf

cc: George Y. Tengan, Maui Department of Water Supply



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CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

2003 NOV 12 PM 2:41

BELT COLLINS HAWAII

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD / CWB

11019PAW.03

November 6, 2003

Mr. Glenn T. Koyama
Belt Collins Hawaii Ltd.
2153 North King Street
Suite 200
Honolulu, Hawaii 96819-4554

Dear Mr. Koyama:

**Subject: Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

The Department of Health, Clean Water Branch (CWB), has reviewed the subject document and offers the following comments:

1. The Army Corps of Engineers should be contacted at (808) 438-9258 to identify whether a Federal license or permit (including a Department of Army permit) is required for this project. Pursuant to Section 401(a)(1) of the Federal Water Pollution Act (commonly known as the "Clean Water Act"), a Section 401 Water Quality Certification is required for "[a]ny applicant for Federal license or permit to conduct any activity including, but not limited to, the construction or operation of facilities, which may result in any discharge into the navigable waters...."
2. A National Pollutant Discharge Elimination System (NPDES) general permit coverage is required for the following activities:
 - a. Storm water associated with industrial activities, as defined in Title 40, Code of Federal Regulations, Sections 122.26(b)(14)(i) through 122.26(b)(14)(ix) and 122.26(b)(14)(xi).
 - b. Construction activities, including clearing, grading, and excavation, that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. **An NPDES permit is required before the commencement of the construction activities.**
 - c. Discharges of treated effluent from leaking underground storage tank remedial activities.
 - d. Discharges of once through cooling water less than one (1) million gallons per day.

- e. Discharges of hydrotesting water.
- f. Discharges of construction dewatering effluent.
- g. Discharges of treated effluent from petroleum bulk stations and terminals.
- h. Discharges of treated effluent from well drilling activities.
- i. Discharges of treated effluent from recycled water distribution systems.
- j. Discharges of storm water from a small municipal separate storm sewer system.
- k. Discharges of circulation water from decorative ponds or tanks.

The CWB requires that a Notice of Intent (NOI) to be covered by a NPDES general permit for any of the above activities be submitted at least 30 days before the commencement of the respective activities. The NOI forms may be picked up at our office or downloaded from our website at <http://www.state.hi.us/doh/eh/cwb/forms/genl-index.html>.

- 3. The applicant may be required to apply for an individual NPDES permit if there is any type of activity in which wastewater is discharged from the project into State waters and/or coverage of the discharge(s) under the NPDES general permit(s) is not permissible. An application for the NPDES permit is to be submitted at least 180 days before the commencement of the respective activities. The NPDES application forms may also be picked up at our office or downloaded from our website at <http://www.state.hi.us/doh/eh/cwb/forms/indiv-index.html>.
- 4. Hawaii Administrative Rules, Section 11-55-38, also requires the owner to either submit a copy of the new NOI or NPDES permit application to the State Department of Land and Natural Resources, State Historic Preservation Division (SHPD), or demonstrate to the satisfaction of the DOH that the project, activity, or site covered by the NOI or application has been or is being reviewed by SHPD. Please submit a copy of the request for review by SHPD or SHPD's determination letter for the project.

If you have any questions, please contact the CWB at 586-4309.

Sincerely,



DENIS R. LAU, P.E., CHIEF
Clean Water Branch



December 22, 2003
2002.72.0100 / 03P-343

Mr. Denis R. Lau, P.E., Chief
Clean Water Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Dear Mr. Lau:

**Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

Thank you for your letter of November 6, 2003 responding to our preconsultation notice to prepare an Environmental Assessment for the water line replacement in Ulupalakua, Maui. As we prepare the EA, we will address your comments and consider your input for incorporation in the Draft EA. When the Draft EA is completed, we will transmit a copy to you for further review and comment.

Thank you for your participation in this review process.

Sincerely yours,

BELT COLLINS HAWAII LTD.

A handwritten signature in black ink, appearing to read 'Glen T. Koyama'.

Glen T. Koyama

GTK:lf

cc: George Y. Tengan, Maui Department of Water Supply

Honolulu
Guam
Hong Kong
Philippines
Seattle
Singapore
Thailand

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801-3378

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2003 NOV 17 PM 2: 36

BELT COLLINS HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
EMD/SHWB

November 12, 2003

S1114LO

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554

Dear Mr. Koyama:

SUBJECT: Environmental Assessment for Proposed Water Line Replacement
Kamaole Tank-Kanaio, Maui, Hawaii

Thank for the opportunity to offer comments on the above cited document. Your request has been reviewed by the Hazardous Waste, Underground Storage Tank, and Solid Waste Programs within the Solid and Hazardous Waste Branch.

We have no comments to offer at this time.

Sincerely,

A handwritten signature in black ink, appearing to read "SYK Chang".

STEVEN Y.K. CHANG, P.E., CHIEF
Solid and Hazardous Waste Branch



December 22, 2003
2002.72.0100 / 03P-350

Mr. Steven Y.K. Chang, P.E., Chief
Solid and Hazardous Waste Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Dear Mr. Chang:

**Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

Thank you for your letter of November 12, 2003 responding to our preconsultation notice to prepare an Environmental Assessment for the water line replacement in Ulupalakua, Maui. When the Draft EA is completed, we will transmit a copy to you for further review and comment.

Thank you for your participation in this review process.

Sincerely yours,

BELT COLLINS HAWAII LTD.


Glen T. Koyama

Honolulu
Guam
Hong Kong
Philippines
Seattle
Singapore
Thailand

GTK:lf

cc: George Y. Tengan, Maui Department of Water Supply

LINDA LINGLE
GOVERNOR OF HAWAII



STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HAWAII 96801-3378

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2003 NOV 26 PM 2:45

BELT COLLINS HAWAII

CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

In reply, please refer to:
File:

October 3, 2003

Mr. Glenn T. Koyama
Belt Collins.
2153 North King Street, Ste 200
Honolulu, HI 96819

Dear Mr. Koyama:

**SUBJECT: Comments to the Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank, Kanaio, Maui, Hawaii**

Our comments should be printed as follows:

“Project activities shall comply with the Administrative Rules of the Department of Health:

- Chapter 11-46 Community Noise Control.

Should there be any questions, please contact me at 586-4701.

Sincerely,

Russell S. Takata
Program Manager
Noise, Radiation & IAQ Branch



December 22, 2003
2002.72.0100 / 03P-344

Mr. Russell S. Takata
Program Manager
Noise, Radiation & IAQ Branch
Department of Health
State of Hawaii
P.O. Box 3378
Honolulu, HI 96801-3378

Dear Mr. Takata:

**Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

Thank you for your letter of October 3, 2003 responding to our preconsultation notice to prepare an Environmental Assessment for the water line replacement in Ulupalakua, Maui. As we prepare the EA, we will address your comments and consider your input for incorporation in the Draft EA. When the Draft EA is completed, we will transmit a copy to you for further review and comment.

Honolulu
Guam
Hong Kong
Philippines
Seattle
Singapore
Thailand

Thank you for your participation in this review process.

Sincerely yours,

BELT COLLINS HAWAII LTD.

A handwritten signature in black ink that reads 'Glen T. Koyama'.

Glen T. Koyama

GTK:lf

cc: George Y. Tengan, Maui Department of Water Supply

LINDA LINGLE
GOVERNOR OF HAWAII



CHIYOME L. FUKINO, M.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH

P.O. BOX 3378
HONOLULU, HAWAII 96801-3378

In reply, please refer to:
EMD/SDWB

November 21, 2003

Mr. Glen T. Koyama
Belt Collins Hawaii, Ltd.
2153 North King Street, Suite 200
Honolulu, Hawaii 96819-4554

Dear Mr. Koyama:

SUBJECT: ENVIRONMENTAL ASSESSMENT
PROPOSED WATERLINE REPLACEMENT
KAMAOLE TANK - KANAIO, MAUI, HAWAII

This letter is in response to your October 31, 2003, letter regarding a request for preliminary comments on the proposed waterline replacement project for Ulupalakua Water System in Ulupalakua, Maui.

We apologize for the delay in response. Per a November 19, 2003, phone conversation between Ms. Denise Dang of the Safe Drinking Water Branch and yourself, this response has been drafted to transmit the Drinking Water State Revolving Fund (DWSRF) Environmental Review requirements.

We recommend that the County of Maui, Department of Water, be consulted to check if they would be interested in funding this project via DWSRF funds. If a possibility exists that they may use the DWSRF funds, we recommend that the environmental assessment address the DWSRF Environmental Review requirements.

Enclosed for your information and use:

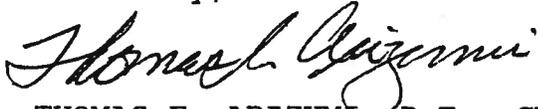
1. Appendix H - State Environmental Review Process (SERP)
2. Appendix M - Federal Requirements for DWSRF Loan Agreements (To be included in Specifications for project)
3. Waiaha Production Well and Reservoir - Sample Draft Environmental Assessment

DEPT. OF WATER SUPPLY
COUNTY OF MAUI
2003 DEC -5 AM 8:51
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Mr. Glen T. Koyama
November 21, 2003
Page 2

If you have any questions or comments on the Intended Use Plan, please contact Denise Dang of the Safe Drinking Water Branch, at (808) 586-4258.

Sincerely,



THOMAS E. ARIZUMI, P.E., CHIEF
Environmental Management Division

DD:slm

Enclosures

- c: 1. George Tengan (w/o enclosures)
Maui Department of Water Supply
✓ 2. Herbert Kogasaka (w/o enclosures)
Maui Department of Water Supply
3. Wastewater Branch (w/o enclosures)
4. Jose Caratini (w/o enclosures)
U.S. Environmental Protection Agency



OFFICE OF HAWAIIAN AFFAIRS
711 Kapi`olani Blvd. , Suite 500
Honolulu, Hawaii 96813
808-594-1944
josev@oha.org

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2003 NOV 17 PM 2: 16

BELT COLLINS HAWAII

November 14, 2003

Mr. Glen T. Koyama
Belt Collins Hawaii Ltd.
2153 North King Street, Suite 200
Honolulu, HI 96819-4554

Dear Mr. Koyama:

It has recently come to my attention that a major, proposed water line replacement project for the Ulupalakua Water System, in Ulupalakua, Maui, is scheduled for servicing from Keokea to Kanaio.

Your company map shows the intended layout from Keokea to Kanaio. And, your 3 page "Proposed Water Line Replacement" statement says the public comment period will end by November 18th. So I am writing to request that I be listed as a consulted party on the Environmental Assessment, and am asking you to please address my questions and concerns listed below:

1. As part of this water line replacement project, can an ample size diameter water distribution pipeline be provided for the agricultural land in the Hawaiian Home Lands section located in the area down below "GRANDMA'S" restaurant makai in Keokea?
2. Who are intended as the recipients of this water line?
3. Is it a dual line system, with untreated/unfiltered water for farmers and fire, with a separate line for residential use?
4. Are you putting in more than replacement lines?
5. Is this Keokea to Kanaio replacement water pipeline the first stage of an anticipated two stage project? If so, will the second stage extend this water pipeline to possibly Kaupo or where? If so, what would be the proposed size of the pipes (i.e., the diameter in inches of the pipes) in the second stage?
6. What is the proposed size of the water pipes (i.e., the diameter measured in inches of the pipes) to be laid in this replacement plan?

Maui County Department of Water Supply explained that the replacement pipelines for water distribution would be 12 inches and 8 inches in diameter.

Is there a possibility of sixteen inch diameter pipe for water distribution being used in some of the water pipeline in this replacement?

7. What is the level of anticipated population growth that this project is using for its guideline?

Mahalo for keeping me informed about what is planned and happening.

Aloha,

José Villa
Lead Advocate - Housing

ALAN M. ARAKAWA
Mayor



GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON, P.E.
Deputy Director

DEPARTMENT OF WATER SUPPLY

COUNTY OF MAUI

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

December 23, 2003

Mr. Jose Villa
Office of Hawaiian Affairs
711 Kapi'olani Blvd. Suite 500
Honolulu, Hawaii 96813

Dear Mr. Villa:

Subject: Ulupalakua Water System Improvements

This letter is in response to your letter to Mr. Koyama of Belt Collins Hawaii.

1. Provision of water for the Hawaiian Home Lands in Keokea is being addressed by the Department of Hawaiian Home Lands, plans are to extend the Lower Kula System and is not reviewed as part of this project. The Ulupalakua Water System Improvement Project is located past the Keokea area on the Upper Kula System.
2. The water line for this project is a replacement for an existing pipe line from the Kamaole Tank that extends to the Kanaio Tank and is primarily to improve service to the consumers along this alignment.
3. This improvement is not designed as part of a dual line system and the pipeline is intended to convey treated water.
4. The pipe line is considered a replacement line, although the sizes are proposed to be in compliance with current DWS standards.
5. This project will be beneficial to the consumers along the Kuhulu, Paieahu, and Kanaio Laterals since the point of adequacy for those consumers will be that much shorter. It is anticipated that any developer along those laterals will be required to upgrade those systems to DWS standards should they wish to develop additional water demands.
6. The replacement pipes will be sized from 12 inch to 8 inch to 6 inch diameter ductile iron pipes. It is not anticipated to be replaced by a 16 inch pipe.
7. We understand that there are land owners who may benefit from this improvement along with current consumers.

Thank you for your interest and input in this project. If you have any more questions, please call Alva Nakamura at our Engineering Division at (808) 270-7835.

Sincerely,

George Y. Tengan
Director

hk

"By Water All Things Find Life"



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2003 NOV -5 PM 2:11

BELT COLLINS HAWAII

Ulupalakua Ranch, Inc.

P.O. Box 901, Ulupalakua
Maui, Hawaii 96790
Phone (808) 878-1202
Fax (808) 878-2178

Glen T. Koyama
Belt Collins Hawaii Ltd.
2153 North King Street, Suite 200
Honolulu, HI 96819-4554

**Re: October 28, 2003 letter to C. Pardee Erdman concerning the
Environmental Assessment for the Proposed Water Line Replacement for
Kamaole Tank – Kanaio, Maui, Hawaii**

Mr. Koyama:

Other than to concur with the summary provided to Ulupalakua Ranch in the above referenced letter and to state emphatically the need for the replacement, the Ranch has no comment at this time.

However, the Ranch would like to be a consulted party while the Environmental Assessment is being prepared and, as such, offer this letter confirming that desire.

Thank you for your time and consideration in this matter. Please do not hesitate to call upon the Ranch if you have any questions or needs.

Sincerely,



Anthony J. Durso
Resource Manager



December 22, 2003
2002.72.0100 / 03P-346

Mr. Anthony J. Durso
Resource Manager
Ulupalakua Ranch, Inc.
P.O. Box 901
Ulupalakua, Maui, HI 96790

Dear Mr. Durso:

**Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

Thank you for your letter of November 4, 2003 responding to our preconsultation notice to prepare an Environmental Assessment for the water line replacement in Ulupalakua, Maui. When the Draft EA is completed, we will transmit a copy to you for further review and comment.

Thank you for your participation in this review process.

Sincerely yours,

BELT COLLINS HAWAII LTD.

A handwritten signature in black ink, appearing to read 'Glen T. Koyama'.

Glen T. Koyama

Honolulu
Guam
Hong Kong
Philippines
Seattle
Singapore
Thailand

GTK:lf

cc: George Y. Tengan, Maui Department of Water Supply

RECEIVED

SALLY RAISBECK
427 Liholiho Street Wailuku HI 96793 808-244-9604 sally@maui.net

2003 NOV 13 PM 2: 18

BELT COLLINS HAWAII

November 10, 2003

Belt Collins
2153 North King St, Ste 200
Honolulu HI 96819
Attn: Glenn T. Kuyama
1-808-521-5361

Dear Mr. Kuyama:

This letter will confirm my telephone request to you today to be considered a consulted party for the Ulupalakua Pipeline Replacement project, for which Belt Collins is doing the Environmental Assessment.

Your information to me on the phone was that the replacement pipeline will be 8 inches in diameter for most of its 5-mile length, and some of it will be 6 inches in diameter.

I look forward to seeing many more details in the draft EA.

Thank you.

Sincerely,


Sally Raisbeck



December 22, 2003
2002.72.0100 / 03P-347

Ms. Sally Raisbeck
427 Liholiho Street
Wailuku, Maui, HI 96793

Dear Ms. Raisbeck:

**Environmental Assessment
Proposed Water Line Replacement
Kamaole Tank - Kanaio, Maui, Hawaii**

Thank you for your letter of November 10, 2003 responding to our preconsultation notice to prepare an Environmental Assessment for the water line replacement in Ulupalakua, Maui. When the Draft EA is completed, we will transmit a copy to you for further review and comment.

- Thank you for your participation in this review process.

Sincerely yours,

BELT COLLINS HAWAII LTD.

A handwritten signature in black ink that reads 'Glen T. Koyama'.

Glen T. Koyama

Honolulu
Guam
Hong Kong
Philippines
Seattle
Singapore
Thailand

GTK:lf

cc: George Y. Tengan, Maui Department of Water Supply



Earth Foundation

Stewards of the Land, Sea & Native **RECEIVED**

1135 Makawao Ave., #104 - Makawao, Hawaii 96768 - Ph: (808) 878-1770 - earthfoundation@mail.com
2003 NOV 14 PM 2:00

VIA U.S. EXPRESS MAIL

BELT COLLINS HAWAII

November 12, 2003

Belt Collins Hawaii Ltd.
2153 North King Street
Suite 200
Honolulu, HI 96819-4554

Attention: Mr. Glen T. Koyama

Dear Mr. Koyama:

Aloha. This letter is a request that we be considered a consulted party for the "proposed water line replacement" project for the Ulupalakua Water System, in Ulupalakua, Maui, for which Belt Collins is doing the Environmental Assessment. Mahalo for your time and help.

We have reviewed your map and the 3 page Proposed Water Line Replacement statement that show the intended layout from Keokea to Kanaio. You state that the public comment period will end by November 18th. Therefore, we are writing to request, please, for you to address our questions and concerns below:

1. What is the proposed diameter size of the water pipes to be laid in this replacement plan?

On November 10th, a prominent member of the Maui County Department of Water Supply said the replacement pipelines for water distribution would be twelve inches and eight inches in diameter.

Is there a possibility of sixteen inch diameter pipe for water distribution being used in some of the water pipeline in this replacement?

2. What is the level of anticipated population growth that this project is using for its guideline?

3. Who are the intended recipients and what is the purpose of the replacement water pipeline?

4. Is it a dual line system, with untreated/unfiltered water for farmers and fire, with a separate line for residential use?

5. Are you putting in more than replacement lines?

6. Is this the first phase of an anticipated two phase project? If so, will the second phase extend this water pipeline to the Kaupo area? If so, what would be the proposed diameter size of the water pipes in the second phase?

7. As part of this water line replacement project, would it be possible for an ample size diameter water distribution pipeline to be provided for the agricultural land in the Hawaiian Home Lands section located in the area down below "Grandma's" restaurant makai in Keokea?

We look forward to your reply and will anticipate being kept informed of progress and planning as things are moving along. Thanking you in advance for your kind response.

Sincerely,

Corey Ryder
President

ALAN M. ARAKAWA
Mayor



GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON, P.E.
Deputy Director

**DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI**

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

December 23, 2003

Mr. Corey Ryder
Earth Foundation
1135 Makawao Ave. #104
Makawao, Hawaii 96768

Dear Mr. Ryder:

Subject: Ulupalakua Water System Improvements

This is response to your letter to Mr. Koyama of Belt Collins Hawaii, Ltd.

1. The pipe sizes proposed for this replacement project will be range 12-inch to 6-inch in diameter ductile iron pipe. 16-inch pipe lines are not anticipated for this project.
2. It is anticipated that this waterline may allow development and increase population growth by the fact that improvements to current DWS standards will allow for increase in capacity. However, those people wanting to get water service will have to be put on the priority list and await there turn for adequate water source capacity.
3. The intended beneficiary are the current consumers on the system now, with possible others whose turn comes up on the priority list.
4. This pipeline is not currently planned as part of a dual system. The improvement is intended to convey treated water.
5. We are putting in replacement lines which will be in conformance to DWS standards.
6. This pipeline project will be a replacement for the transmission from the Kamaole Tank to the Kanaio Tank and along the Ulupalakua Lateral. Other areas which may benefit from this improvement may be consumers on the Kuhulu, Paiehu, and Kanaio Lateral, as this will allow those consumers to be closer to their point of adequacy. We do not have plans to do additional improvements at this time. It is not the intent to extend this line to Kaupo.
7. Current plans for the Hawaiian Home Lands in Keokea are that the Department of Hawaiian Home Lands are installing pipeline from the Lower Kula Pipeline source to service this area. The Ulupalakua Water Improvements are located further out past the Keokea area and supplied from the Upper Kula Water System.

Thank you for your interest in our project. If you have any more questions, please call Alva Nakamura of our Engineering Division at 270-7835.

Sincerely,



George Y. Tengan
Director

hk

"By Water All Things Find Life"



Melody Farm

2441 Lilikoi Road, Ha'iku, Maui, Hawaii 96708

Phone & Fax: (808) 572-1804

Email: <melofarm@aloha.net>

RECEIVED

2003 NOV 17 PM 2:33

14 November 03

BELT COLLINS HAWAII

Belt Collins Hawaii Ltd.
2153 North King Street, Suite 200
Honolulu, HI 96819-4554

Attention: Mr. Glen T. Koyama

Dear Mr. Koyama:

It has recently come to our attention that a major, proposed water line replacement project for the Ulupalakua Water System, in Ulupalakua, Maui, is being considered for servicing from Keokea to Kanaio.

Your company map shows the intended layout from Keokea to Kanaio. And, your 3 page "Proposed Water Line Replacement" statement says the preliminary public comment period will end by November 18th. We are requesting that we be listed as a consulted party on the Environmental Assessment and asking you to please address our questions and concerns which should be addressed in the EA, as listed below:

1. As part of this water line replacement project, can an ample size diameter water distribution pipeline also be provided for the agricultural land in the Hawaiian Home Lands section located in the area down below "GRANDMA'S Restaurant" makai in Keokea?
2. Who are intended as the recipients of this water line?
3. Is it a dual line system with untreated water for farmers and fire and a separate line for residential use?
4. Are you intending to install only replacement lines, or are there new lines under consideration? If so, where?
5. Is this Keokea to Kanaio replacement water pipeline the first stage of an anticipated two stage project? If so, will the second stage extend this water pipeline to possibly Kaupoo, or where? If so, what would be the proposed size of the pipes (i.e., the diameter in inches of the pipes) in the second stage?
6. What is the proposed size of the water pipes (i.e., the diameter measured in inches of the pipes) to be laid in this replacement plan?

Maui County Department of Water Supply explained that the replacement pipelines for water distribution would be 12 inches and 8 inches in diameter. Is there a possibility of sixteen inch diameter pipe for water distribution being considered in some of the water pipeline in this replacement?

7. What is the level of anticipated population growth that this project is using for its guideline?

As organic farmers, we greatly appreciate the needs of farmers in Keokea, Ulu, and Kanaio being adequately addressed. Mahalo for keeping us informed on the progress of this project.

Sincerely,



Diana Dahl, Trustee Hawaii Organic Farmers Association (HOFA)



Roy H. Smith, past president, HOFA

cc.: Mr. Herb Kogasaka
Dept of Water Supply
County of Maui

ALAN M. ARAKAWA
Mayor



RECEIVED
GEORGE Y. TENGAN
Director

JEFFREY T. PEARSON, P.E.
Deputy Director

2003 DEC -1 PM 2:51

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI
BELT COLLINS HAWAII

200 SOUTH HIGH STREET
WAILUKU, MAUI, HAWAII 96793-2155
www.mauiwater.org

November 25, 2003

Ms. Diana Dahl
Diana Dahl Enterprises
P. O. Box 984
Haiku, HI 96708

Dear Ms. Dahl:

Subject: Ulupalakua Water System Improvements

Thank you for your letter of inquiry on the Ulupalakua Water System Improvements. In response to your questions, the County does not have a waterline from Ulupalakua to Kaupo. There is no water line easement in favor of the County between the Ulupalakua Water System and Kaupo.

We will include you as a consulted party in the environmental assessment process.

In regards to a pipeline for Hawaiian Home Lands, the Department of Hawaiian Home Lands is working with the Department to make water provisions for the Keokea Farm Lots Subdivision. The Ulupalakua Water System Improvements Project is intended to replace an existing County waterline in Ulupalakua which would provide sufficient capacity for the existing consumers. If development require additional demands, that particular developer will be required to provide the infrastructure for source, storage, and transmission from the point of adequacy on the County System to the development and its distribution system. The Department is replacing its waterline and does not intend to install a "dual waterline." The Department's improvement does not have provisions for providing water from this system to Kaupo. The anticipated size of mains will be 6 inch, 8 inch, and 12 inch lines as determined by analysis.

If there are any questions, please call our Engineering Division at 279-7835.

Sincerely,

George Y. Tengan
Director

hk

cc: Belt Collins Hawaii, Ltd.

"By Water All Things Find Life"

APPENDIX B

**BOTANICAL RESOURCES ASSESSMENT
'ULUPALAKUA WATER SYSTEM IMPROVEMENTS
MAKAWAO DISTRICT, MAUI**

by

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Prepared for: **BELT COLLINS HAWAII**

November 2003

**BOTANICAL RESOURCES ASSESSMENT
'ULUPALAKUA WATER SYSTEM IMPROVEMENTS
MAKAWAO DISTRICT, MAUI**

INTRODUCTION

The Department of Water Supply (DWS), County of Maui, is proposing to improve the 'Ulupalakua Water System that presently services the 'Ulupalakua/Kanaio area. This section of the Upper Kula Water System consists of approximately five miles of a transmission line extending from the Kama'ole Tank to a reservoir in Kanaio, four branch laterals, and water tanks. The existing line ranges from 2 inches to 6 inches in diameter and generally runs along the 3,000-foot contour of Haleakala's southwestern flank. The four laterals extend makai of the main line toward the Kula and Pi'ilani Highways.

Extending approximately one mile to the north of the 'Ulupalakua Water System to the Kula Sanitorium Tank is a section of the Upper Kula Water System that is being contemplated for future upgrade. This section is included in the botanical resources assessment study, although no specific plans have or are being prepared at this time.

The project area water system is currently old and outdated and does not meet current water system standards. The existing system is not reliable and requires much effort by DWS to maintain the lines in proper operating condition and to avoid the frequent leakages/breakages that usually accompany aging pipes.

The DWS is proposing to replace the existing lines with new lines along the same general alignment as the existing lines. They will consist of larger diameter pipes to comply with the minimum fire flow requirements and current DWS standards. An Environmental Assessment (EA) will be prepared for the proposed water line improvements.

Vegetation along the majority of the existing transmission line corridor, from the Kula Sanitorium Tank to about Luapelani, consists of Kikuyu grass-dominated pasture land. From Luapelani to the reservoir in Kanaio, the water line crosses scrub vegetation dominated by Christmas berry thickets in many places. Field studies to assess the botanical resources along the transmission line corridor were conducted on 20, 21, and 22 October 2003 by a team of three botanists. The primary objectives of the field survey were to:

1. prepare a general description of the vegetation along the study corridor;
2. search for threatened and endangered species as well as species of concern; and
3. identify areas of potential environmental problems or concerns and propose appropriate mitigation measures.

SURVEY METHODS

Prior to the field studies, a search was made of the pertinent literature to familiarize the principal investigator with other botanical studies conducted in the general area. Information from the Hawai'i Natural Heritage Program database was also obtained. Topographic maps and recent, colored aerial photographs were examined to determine vegetation cover patterns, terrain characteristics, access, boundaries, and reference points.

The proposed alignment was flagged and staked at 200-foot intervals by the survey engineers prior to our field studies. The alignment was also delineated on the colored aerial photographs. A corridor 100 feet wide, that is, 50 feet on each side of the staked center line was surveyed. The less disturbed section of the transmission line corridor through the scrub vegetation was surveyed more intensively as rare plants were more likely to be found within this vegetation type.

DESCRIPTION OF THE VEGETATION

The plant names used in the discussion follow Wagner et al. (1990) and Wagner and

Herbst (1999) for the flowering plants. The few recent name changes are those reported in the Hawaii Biological Survey series (Evenhuis and Eldredge, editors, 1999-2002). The names of the ferns and fern allies follow the most recent treatment by Palmer (2002).

Kikuyu Grass Pasture Land

Kikuyu grass (Pennisetum clandestinum), native to tropical Africa, is a vigorous perennial sending out long, strong runners and forming thick, dense mats. It prefers cool, moist regions with deep, loose soils. Kikuyu has been widely planted by ranchers because it grows rapidly and withstands grazing and trampling very well, however, it does have a tendency to become dry and woody underneath the rank top growth if not closely cropped. It is the dominant grass throughout the open, rolling pasture lands along the water line corridor.

Because Kikuyu forms such dense mats, other species tend to occur sporadically, usually in areas where the grass cover has been disturbed or is thinner. These include patches of white clover (Trifolium repens), common vetch (Vicia sativa), Spanish clover (Desmodium incanum), velvet grass (Holcus lanatus), balloon plant (Asclepias physocarpa), orchard grass (Dactylis glomerata), and hairy horseweed (Conyza bonariensis). African dropseed or rattail grass (Sporobolus africanus) is locally abundant in places, especially along the jeep roads where the soil has been compacted. Dense mats of molasses grass (Melinis minutiflora) are often found associated with the gulches which cross the pasture lands.

Two variants of the Kikuyu grass pasture land can be recognized in the field based on substrate type. Along the north half of the water line corridor, rocky outcrops are common; the rough, undulating substrate is easily identified on the colored aerial photographs. Soils in this area consist primarily of Kaimu extremely stony peat, 7 to 25 percent slopes, "KCXD" on the soil maps (Foote et al. 1972), and Kula very rocky loam, 12 to 40 percent slopes, "KxbE" on the soil maps.

Pockets of moist soil between the rocks support smaller herbaceous species such as hairy cat's ear (Hypochoeris radicata), field madder (Sherardia arvensis), petty spurge (Euphorbia peplus), narrow-leaved plantain (Plantago lanceolata), scarlet pimpernel (Anagallis arvensis), and chickweed (Stellaria media). Several native ferns which include 'iwa'iwa (Asplenium adiantum-nigrum), 'oali (Pteris cretica), kilau (Pteridium aquilinum), and moa (Psilotum nudum), a fern ally, as well as the introduced blechnum fern (Blechnum appendiculatum), sword fern (Nephrolepis multiflora), and woodfern (Christella dentata) occur on the rock outcrops. Woody components which are found on rocky areas include shrubs of Christmas berry (Schinus terebinthifolius), lantana (Lantana camara), blackberry (Rubus argutus), Hill raspberry (Rubus niveus), and hairy abutilon (Abutilon grandifolium); and scattered trees or small stands of black wattle (Acacia mearnsii), silkoak (Grevillea robusta), and jacaranda (Jacaranda mimosifolia), 20 to 30 feet tall.

The second variant of this vegetation type is found mostly on 'Ulupalakua Ranch lands. The silt loam to loamy coarse sand soils in this area developed from volcanic ash and material weathered from cinder so there are few rock outcrops. The soils belong to the 'Ulupalakua, Uma, and Io series (Foote et al. 1972). The smooth slopes are covered almost exclusively by Kikuyu grass. Large blocks of very tall Eucalyptus species and black wattle trees are found scattered throughout the pasture. A few, small, fenced plantings of koa (Acacia koa) and Cook pine (Araucaria columnaris) are found near the water line corridor. Just outside of the corridor, near station 162+50, is a small stand of very large and old quinine trees (Cinchona pubescens). This is all that remains of the quinine plantation that was started at 'Ulupalakua in 1868 (Wagner et al. 1990).

Scrub Vegetation

This vegetation type occurs on the Kanaio (south) end of the water line corridor. Two variants of this vegetation type are also recognized. On land mapped as "rVS", very stony land (Foote et al. 1972), the vegetation occurs as scattered pockets on barren 'a'a lava. White to grayish-colored lichens such as Stereocaulon, Siphula,

Parmelia, and Usnea are common on the large outcroppings. Locally abundant are patches of Natal redtop grass (Melinis repens) and air plant (Bryophyllum pinnatum). Black wattle trees form scattered stands here and there. Other woody components observed on the 'a'a substrate include a few native species such as 'ohi'a (Metrosideros polymorpha), 'a'ali'i (Dodonaea viscosa), pukiawe (Styphelia tameiameia), 'ulei (Osteomeles anthyllidifolia), and 'akia (Wikstroemia oahuensis). Besides black wattle, other introduced or non-native shrubs and trees include Christmas berry, camphor (Cinnamomum camphora), lantana, and silkoak. Orange-colored Teloschistes lichen are frequently observed on branches of shrubs and trees.

As the water line corridor nears its terminus, the substrate is a rocky loamy coarse sand ("URD") with rock outcrops covering 5 to 10 percent of the surface. The vegetation becomes a mosaic or patchwork of dense Christmas berry thickets interspersed with open, Kikuyu grass-covered areas. Woody cover is about 40 to 50 percent. Scattered stands of black wattle are occasionally encountered. Large stands of Eucalyptus and pine groves (Pinus spp.) are found near homes. Native plants occur as scattered individuals and include 'akia, 'ulei, olopua (Nestegis sandwicensis), and 'iliahialo'e (Santalum ellipticum).

RARE PLANTS

Database information from the Hawai'i Natural Heritage Program records populations of four rare plant species from the area south of Pu'u Mahoe and which might cross the project corridor. These are the alani (Melicope knudsenii), 'aiea (Nothoestrum latifolium), 'ahakea (Bobea sandwicensis), and keahi (Nesoluma polynesianum). The alani is a listed endangered species protected by Federal and State endangered species laws. The 'aiea is a candidate species for listing as threatened or endangered by the U.S. Fish and Wildlife Service. The 'ahakea and keahi are species of concern (U.S. Fish and Wildlife Service 1999a); species of concern means that there is a need for more biological and/or taxonomic information regarding whether a species might need conservation actions in the future. All of these plants are large shrubs to medium-sized trees.

None of these plants or any other rare plants were found on or adjacent to the proposed water line corridor. A list of all the native plants recorded from the project corridor is presented in Table 1.

DISCUSSION AND RECOMMENDATIONS

The proposed water line corridor will follow along the same general alignment as the existing lines. The vegetation on and adjacent to the corridor is primarily Kikuyu grass-dominated pasture land. Where there are rock outcroppings, this vegetation type has a greater variety of different plant species, otherwise the Kikuyu forms thick, dense mats which exclude other plants. Large blocks of Eucalyptus and black wattle are found on the areas with deeper soil.

Scrub vegetation is found on the Kanaio (south) end of the corridor. The scrub vegetation on the area with the 'a'a lava flow is somewhat sparse; a number of native species occur here. On the rocky loam coarse sand soils, the scrub vegetation is a mosaic of Christmas berry thickets and open, Kikuyu grass-covered areas.

Only a very few native species are found within the Kikuyu grass pasture land vegetation type; all of them are ferns which are associated with the rocky outcrops. This is not surprising as most areas with soil have usually been disturbed either by the Hawaiians for crop cultivation or later by other peoples. The well-drained soils found on the smooth slopes of 'Ulupalakua Ranch were used for sugar cane cultivation in the mid-1800s. A Cinchona plantation was started in 1868 to produce quinine which is used in the treatment of malaria. Around 1883, the lands around 'Ulupalakua were used for grazing and continue to today; the lands have thus been in pasturage for about 120 years.

The majority of the native plants found during this study occur within the scrub vegetation. A list of all the native species found on the project corridor is presented in Table 1. None of these plants is a threatened and endangered species or a species of concern (U.S. Fish and Wildlife Service 1999a, 1999b; Wagner et

TABLE 1. List of Native Plants Found on the 'Ulupalakua Water System Improvements Project, Maui

Scientific name	Common name	*Status
FERNS & FERN ALLIES		
<i>Asplenium adiantum-nigrum</i>	'iwa'iwa	I
<i>Asplenium trichomanes</i> subsp. <i>densum</i>	'oali'i	E
<i>Lepisorus thunbergianus</i>	pakahakaha, 'ekaha akolea, pua'akuhinia	I
<i>Pellaea ternifolia</i>	kalamoho lau li'i, laukahi, kalamoho	I
<i>Psilotum nudum</i>	moa, moa nahele, pipi, 'o'o moa	I
<i>Pteridium aquilinum</i> var. <i>decompositum</i>	kilau, kilau pueo, pai'a	E
<i>Pteris cretica</i>	'oali	I
FLOWERING PLANTS		
DICOTS		
<i>Acacia koa</i> (planted)	koa	E
<i>Cocculus orbiculatus</i>	huehue, hue	I
<i>Dodonaea viscosa</i>	'a'ali'i, 'a'ali'i ku makani	I
<i>Ipomoea indica</i>	koali 'awa, koali 'awahia	I
<i>Metrosideros polymorpha</i>	'ohi'a, 'ohi'a lehua, lehua	E
<i>Nestegis sandwicensis</i>	olopua, pua, ulupua	E
<i>Osteomeles anthyllidifolia</i>	'ulei, u'ulei	I
<i>Plectranthus parviflorus</i>	'ala'ala wai nui, 'ala'ala wai nui pua ki	I
<i>Santalum ellipticum</i>	'iliahialo'e	E
<i>Solanum americanum</i>	popolo	I?
<i>Styphelia tameiameia</i>	pukiawe, maiele	I
<i>Waltheria indica</i>	'uhaloa, hi'aloa, kanakaloa	I?
<i>Wikstroemia oahuensis</i>	'akia	E
MONOCOTS		
<i>Chrysopogon aciculatus</i>	manienie 'ula, pi'ipi, pilipili 'ula	I?
<i>Cyperus hillebrandii</i>		E
<i>Paspalum scrobiculatum</i>	mau'u laiki	I?

*Status: E = endemic = native only to the Hawaiian Islands.
 I = indigenous = native to the Hawaiian Islands and elsewhere.
 I? = questionably indigenous = data not clear if dispersal to the islands by natural or human-related mechanisms, but weight of evidence suggests probably indigenous.

al. 1999). All of these species can be found in similar habitats throughout the Hawaiian Islands.

Given these findings, the proposed water line improvements are not expected to have a significant negative impact on the botanical resources. The Kikuyu grass is expected to quickly cover over any areas disturbed by the project. There are no reasons to impose any restrictions, conditions, or impediments to the proposed project.

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APPENDIX C

**AVIFAUNAL AND FERAL MAMMAL FIELD SURVEY OF UPPER KULA
WATER SYSTEM REPLACEMENT PROJECT LANDS, MAUI**

Prepared for:

Belt Collins Hawaii, Ltd.

Prepared by:

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3 November 2003

INTRODUCTION

The purpose of this report is to provide the findings of a three day (23-25 October 2002) field survey of lands involved in the Upper Kula Water Replacement Project, Maui. In addition to the field survey data, published and unpublished sources were consulted and are referenced in order to provide a broader perspective of the potential birds and mammals known to occur in this region of Maui. The goals of the field survey were to:

- 1- Document the species of birds and mammals currently on the lands impacted by the proposed waterline and to note their relative abundance.
- 2- Investigate all habitats along the proposed route of the waterline and note any resources important to native birds and mammals as well as migratory birds.

GENERAL SITE DESCRIPTION

The route of the proposed waterline traverses a variety of habitats. Much of the route is currently in pasture. Patches of second growth trees dot the landscape along the route. At the southern end of the proposed route the pasture habitat changes into dry forest containing a mixture of native and alien plants. The portion of the route around the Ulupalakua Ranch and Store, and makai of the highway is composed of developed and open lands with patches of alien brush and trees. The alignment of the waterline ranges in elevation from approximately 3,300 feet elevation to 1,400 feet.

FIELD SURVEY PROTOCOL

The field survey was conducted over three consecutive days. Data were collected from dawn to just after dusk. The entire proposed waterline alignment was surveyed by driving or walking those sections not accessible by jeep. All birds seen or heard along the route were noted and counted in order to determine relative abundance estimates for each species. Two evenings were devoted to searching for the endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*) and the introduced Barn Owl (*Tyto alba*). A Pettersson Elektronik AB Ultrasound Detector D-100 was used to listen for echolocating bats. Records of other mammals were obtained by visual means as well as by tracks and scats. No attempts were made to trap mammals in order to determine their relative abundance. An effort of this magnitude was not possible nor necessary based on the scope of this survey.

The weather during the survey period was generally clear in the morning and cloudy in the afternoon. The winds were light. These conditions made for good visual and auditory detection of birds.

The scientific names used in this report follow Pyle (2002) and Honacki et al. (1982). These sources also give the generally accepted vernacular (common) names currently in use for these species.

RESULTS AND DISCUSSION

Native Birds:

Native birds are defined as those that occur naturally (not man introduced) in Hawaii. This category includes land birds, waterbirds, and seabirds. Native birds can be further subdivided into indigenous species (those that occur not only in Hawaii but elsewhere) and endemic species (those species or subspecies restricted to Hawaii) (Pratt et al. 1987, Hawaii Audubon Society 1997, Pyle 2002). Migratory birds are not permanent residents and do not breed in Hawaii. They are therefore not referred to as native birds.

The only native species recorded on the survey was the Short-eared or Hawaiian Owl (*Asio flammeus sandwichensis*). This endemic subspecies of owl is called Pueo in Hawaiian and serves as an amakua for many Hawaiian families. A total of nine Pueo were seen over the three day survey. It is possible these nine sightings represent three or four individuals seen repeatedly. Pueo hunt during the early morning and late afternoon hours (Pratt et al. 1987, Hawaii Audubon Society 1997). They utilize a wide variety of habitats from agricultural lands to native forests. This species is relatively common on the slopes of Haleakala. It is listed by the State of Hawaii as endangered on Oahu. Pueo feed on rodents, insects, and occasionally birds. They nest on the ground in areas of tall grass. The introduced Barn Owl (*Tyto alba*) is active at night and is sometimes mistaken for the Pueo by those not familiar with the differences between these two species.

The only other native birds that might on occasion occur in this area and at this elevation are the non-endangered Maui Amakihi (*Hemignathus virens wilsoni*) and the non-endangered Apapane (*Himatione sanguinea*). The endangered Hawaiian Goose or Nene (*Branta sanvicensis*) occurs at higher elevation in Haleakala National Park. In speaking with the land owners and their workers I found no one who had seen Nene in the area of this proposed waterline. Unpublished documents produced by the Department of Land and Natural Resources (DLNR 2001-2002) describe their attempts to establish Nene in west Maui. I recorded Nene in pasture habitat on west Maui (Bruner 2003) and at a reservoir in west Maui (Bruner 2002).

No waterbirds or seabirds were recorded on this survey. These birds would not be expected in the habitats found along the proposed waterline route.

Migratory Birds:

The only migratory species recorded on the survey was the Pacific Golden-Plover (*Pluvialis fulva*). This species is not listed as endangered. It is the most abundant migratory shorebird wintering in Hawaii. They breed in the arctic and winter in Hawaii from August through April. A few plover “over-summer” each year and do not return to the arctic to breed. Plover are shorebirds but generally are more commonly seen on lawns, pastures, and open habitats such as agricultural lands and even lava flows. This

species has been extensively studied here in Hawaii and on its arctic breeding grounds (Johnson 1981, 1989, 1993, 2001a, 2001b). A total of 284 plover were tallied on the survey. Many more likely occur in the pastures above and below the proposed waterline alignment. The combination of well grazed pastures and abundant insect prey make this habitat ideal for wintering plover.

The only other migratory shorebird that might occur in this area is the Ruddy Turnstone (*Arenaria interpres*). They forage in small flocks and will utilize pastures and other habitats frequented by plover. None were seen on this survey.

Introduced Birds:

A total of 16 species of introduced (alien) birds were tallied over the course of the survey. Table One documents these species and notes their relative abundance. The Northern Mockingbird (*Mimus polyglottos*), Zebra Dove (*Geopelia striata*), Cattle Egret (*Bubulcus ibis*), and Sky lark (*Alauda arvensis*) were the most abundant introduced species. Other alien species that might occur in the area include: Chukar (*Alectoris chukar*), Wild Turkey (*Meleagris gallopavo*), and Common Peafowl (*Pavo cristatus*) (Bruner 1994, 1998; Hawaii Audubon Society 1997). None of the introduced (alien) birds are listed as endangered.

Mammals:

Despite two evenings searches using an ultra sound detector, no endangered Hawaiian Hoary Bats (*Lasiurus cinereus semotus*) were found. This bat does occur on Maui but in relatively low numbers (Tomich 1986, Kepler and Scott 1990, Duvall and Duvall 1991). They are most abundant on Kauai and the Big Island. The Hawaiian Hoary Bat utilizes a wide variety of habitats to forage for flying insects. They can be seen in native forest, agricultural lands and urban areas as well as over bays and ponds. Recent studies by Jacobs (1991, 1993) and Reynolds et al. (1998) have shed new light on the life history of the Big Island bat populations. They potentially could occur in the area of the proposed waterline.

Feral Pigs (*Sus scrofa*) were seen on two of the three survey days. Feral Cats (*Felis catus*) were seen on every day of the survey. They were most common around ranch buildings and old water tanks. Rats (*Rattus spp.*) and Mice (*Mus musculus*) were seen while driving the ranch roads at night. In addition, a total of six Axis Deer (*Axis axis*) were seen on day two of the survey around 1700 hours in the dry forest section at the southern end of the proposed waterline route.

None of the mammals recorded on this survey were unexpected. These mammals are ubiquitous in this area of Maui.

CONCLUSIONS

The purpose of this field survey was to document the birds and mammals currently found in this area. An additional task was to note any habitat features of particular importance to native or migratory species. The three days of the survey permitted sufficient time to achieve these goals.

The only native bird (Pueo) recorded on the survey is common in this type of habitat on Maui. Open habitats like pastures are favored hunting grounds for Pueo. Likewise, pastures are also ideal foraging areas for the migratory Pacific Golden-Plover. The introduced birds found on the survey were those typical for this elevation and range of habitats. The lack of observations of the endangered Hawaiian Hoary Bat was not unexpected due to their low numbers on Maui. Alien birds and mammals recorded on the survey were those expected to occur in this area. No unusual or unexpected species of birds or mammals were found on the survey.

The proposed waterline will not have a significant impact on the birds and mammals in this area. The installation of the waterline will create a temporary disturbance but once the line is in place the array of birds and mammals should not be significantly different from the present situation.

TABLE ONE

Introduced birds found on a three day (23-25 October 2003) field survey of the proposed route of the Upper Kula Water System Replacement Project, Kula, Maui. The relative abundance estimates are based on data obtained over the course of the survey. Abundant (A) 100+; Common (C) 5—100; Uncommon (U) 1-50.

Common Name	Scientific Name	Relative Abundance
Cattle Egret	<i>Bulbucus ibis</i>	A
Gray Francolin	<i>Francolinus pondicerianus</i>	C
Black Francolin	<i>Francolinus francolinus</i>	U
Ring-necked Pheasant	<i>Phasianus colchicus</i>	U
Spotted Dove	<i>Streptopelia chinensis</i>	U
Zebra Dove	<i>Geopelia striata</i>	A
Barn Owl	<i>Tyto alba</i>	U
Sky Lark	<i>Alauda arvensis</i>	A
Japanese White-eye	<i>Zosterops japonicus</i>	U
Northern Mockingbird	<i>Mimus polyglottos</i>	A
Common Myna	<i>Acridotheres tristis</i>	C
Red-crested Cardinal	<i>Paroaria coronata</i>	C
Northern Cardinal	<i>Cardinalis cardinalis</i>	U
House Finch	<i>Carpodacus mexicanus</i>	C
House Sparrow	<i>Passer domesticus</i>	U
Nutmeg Mannikin	<i>Lonchura punctulata</i>	C

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APPENDIX D

**Archaeological Assessment in Support of the
'Ulupalakua Water System Replacement Project
Kama'ole, Paeahu, Palauea, Keauhou, Papa'anui, and Kanaio
Makawao (Kula and Honua'ula) District, Maui**

Portions of TMK: 2-2-01, 2-1-03, 2-1-08 and 2-1-09

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I. INTRODUCTION

A. Project Background

At the request of Belt Collins Hawai‘i, Cultural Surveys Hawai‘i, Inc. (CSH) conducted an Archaeological Assessment for the proposed ‘Ulupalakua Water System Replacement Project, Kama‘ole to Kanaio Ahupua‘a, Makawao District, Island of Maui (Figures 1-2). The Department of Water Supply (DWS), County of Maui, is proposing to improve the ‘Ulupalakua Water System portion of the Upper Kula Water System that presently services the ‘Ulupalakua/Kanaio area.

The existing project area water system is old and outdated and does not meet current water system standards. The small-diameter pipelines have insufficient sizes to accommodate current demand and inadequate capacity to accommodate fire flow requirements. The existing system is not reliable and requires substantial effort by DWS to maintain the lines in proper operating condition and avoid the frequent leakages/breakages that usually accompany aging pipes. While the main transmission line is buried, many of the smaller pipelines were laid mostly at grade or slightly below, where they were exposed to agricultural, ranching, recreational, and other activities. The DWS is proposing to replace the existing lines along the same general alignment. The new lines will consist of larger-diameter pipes to comply with minimum fire flow requirements and current DWS Standards.

Extending approximately one mile to the north of the ‘Ulupalakua Water System, to the Kula Sanatorium Tank, is a section of the Upper Kula Water System that is being contemplated for future upgrade.

B. Scope of Work

The agreed upon scope of work for the archaeological assessment was as follows:

1. Historical research to include study of archival sources, historic maps, Land Commission Awards and previous archaeological reports to construct a history of land use and to determine if archaeological sites have been recorded on or near the subject property.
2. Field inspection of the project area to identify any surface archaeological features and to investigate and assess the potential for impact to such sites. This assessment will identify any sensitive areas that may require further investigation or mitigation before the project proceeds.
3. Preparation of a report to include the results of the historical research and the fieldwork with an assessment of archaeological potential based on that research, with recommendations for further archaeological work, if appropriate. It will also provide mitigation recommendations if there are archaeologically sensitive areas that need to be taken into consideration.

This scope of work also includes full coordination with the State Historic Preservation Division, and County relating to archaeological matters.

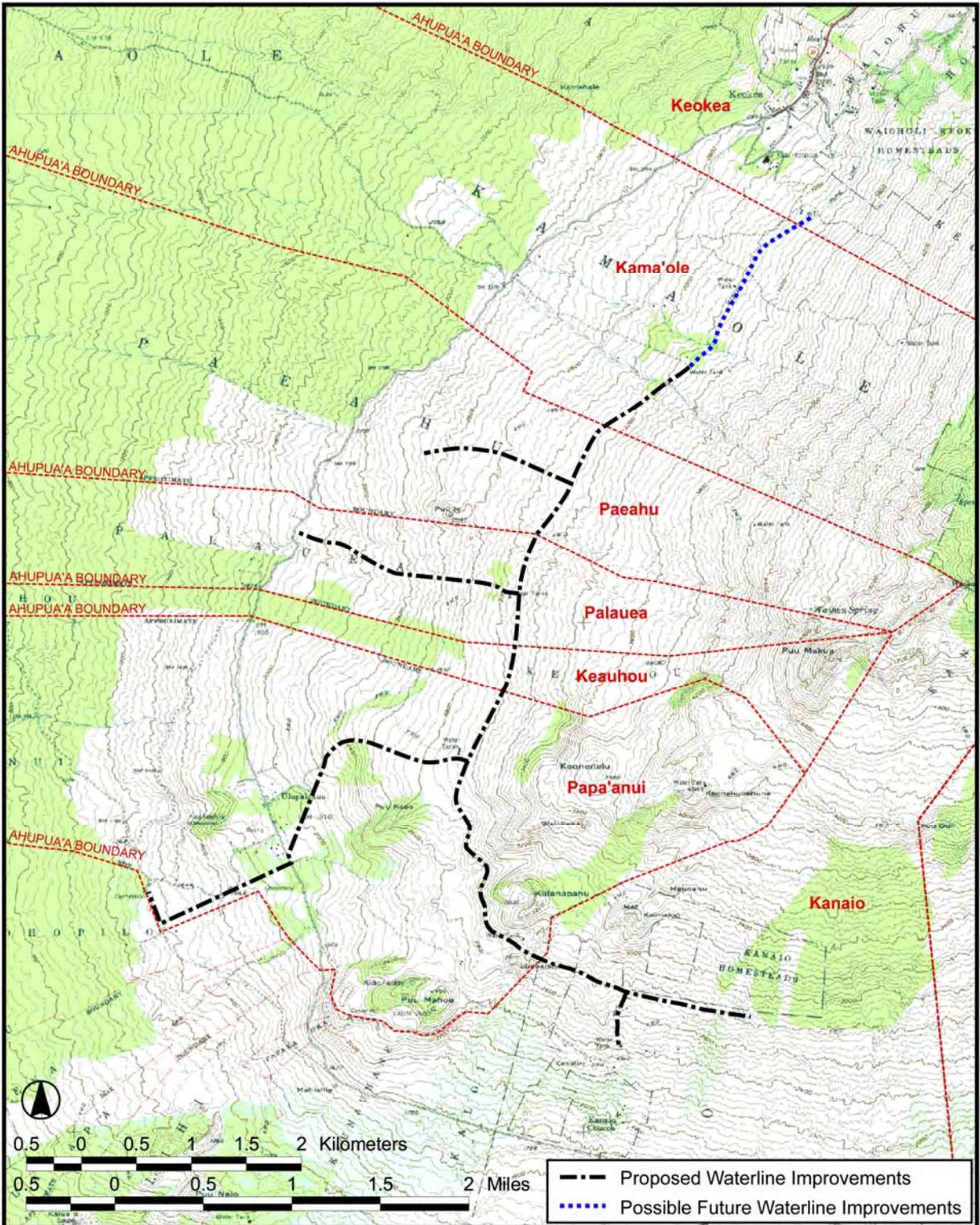


Figure 1 USGS Topographic Map, Makena Quad., Showing Location of the Project Corridor.

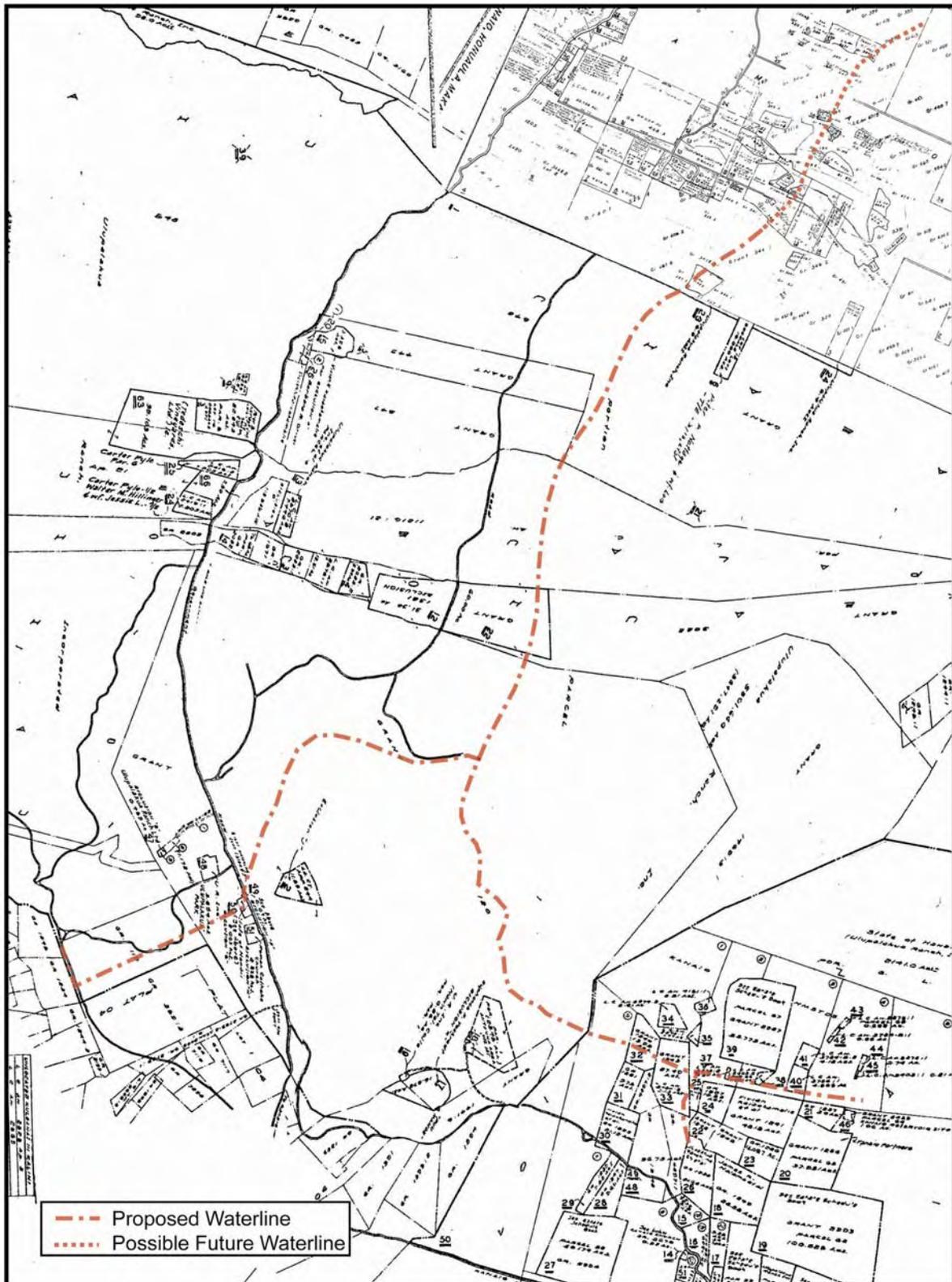


Figure 2 Combined Portions of TMKs 2-1-03, -08, -09, and 2-2-01, Showing the Approximate Location of the Project Corridor.

C. Project Area Description

The 'Ulupalakua Water System Replacement project corridor consists of a transmission line extending approximately five miles from the Kama'ole Water Tank to a reservoir in Kanaio, four branch laterals extending *makai* (seaward) of the main line toward the Kula and Pi'ilani Highways, water tanks varying in size from 9,000 gallons to 500,000 gallons, and associated infrastructure. The existing transmission line ranges from two inches to six inches in diameter and generally runs along the 3,000-foot contour of Haleakalā's southwestern flank. Due to the length of the corridor, the project was broken up into four sections for the purposes of this archaeological assessment.

1. Kama'ole Section

The Kama'ole Section is the northernmost of the project corridor sections. The land is owned by the Haleakalā Ranch and is actively used as pasture for grazing cattle. Elevations within this section of the project corridor range from approximately 3,300-3,150 ft (feet) or 1,005-960 m (meters) amsl (above mean sea level). Soils listed within the Kama'ole Section generally consisted of Ulupalakua Silt Loam (ULD) and Kula Loam (KxD) (Foote et al. 1972). Soils of the Ulupalakua Series are "well-drained soils on intermediate mountain slopes . . . developed in volcanic ash and material weathered from cinders" (Foote et al. 1972:122). Soils of the Kula Series are "well-drained soils on uplands . . . developed in volcanic ash" (Foote et al. 1972:76).

2. Paeahu through Keauhou Section

The land through which the Paeahu through Keauhou Section of the project corridor passes is owned by the 'Ulupalakua Ranch and is actively used as pasture for grazing cattle. Elevations within this section of the project corridor range from approximately 3,150-3,000 ft (960-915 m) amsl. along the proposed main waterline. Along the Paeahu lateral line, elevations range from approximately 3,150-2,500 ft (960-760 m) amsl. Along the Palauea lateral line elevations range from approximately 3,150-1,900 ft (960-580 m) amsl. Soils listed within the Paeahu through Keauhou Section generally consisted of Kaipoi Very Rocky Loam (KDVE), Kula Very Rocky Loam (KxbE), Ulupalakua Silt Loam (ULD), and Io Silt Loam (ISD) (Foote et al. 1972). Soils of the Kaipoi Series are "well-drained soils on uplands . . . developed in volcanic ash and in material weathered from cinders" (Foote et al. 1972:54). Soils of the Io Series are "well-drained soils on valley fill and alluvial fans . . . developed in alluvium derived from basic igneous rock" (Foote et al. 1972:46).

3. Papa'anui Section

The land through which the Papa'anui Section of the project corridor passes is also owned by the 'Ulupalakua Ranch and is actively used as pasture for grazing cattle. Elevations within this section of the project corridor range from approximately 3,000-2,900 ft (915-880 m) amsl along the proposed main waterline. Along the Papa'anui lateral line elevations range from approximately 3,000-1,300 ft (915-395 m) amsl. Soils listed within the Papa'anui Section generally consisted of Io Silt Loam (ISD), Ulupalakua Silt Loam (ULD), Uma Loamy Coarse Sand (UMF, UME) (Foote et al. 1972). Soils of the Uma Series consist of "excessively drained, sandy soils on intermediate mountain slopes . . . developed in volcanic ash and material weathered from cinders" (Foote et al. 1972:122-123).

4. Kanaio Section

The majority of the land through which the Kanaio Section of the project corridor transverses is owned by the State of Hawai‘i. Elevations within this section of the project corridor range from approximately 2,900-2,750 ft (880-840 m) amsl. along the proposed main waterline. Along the Kanaio lateral line, elevations range from approximately 2,750-2,050 ft (880-625 m) amsl. Soils listed within the Kanaio Section generally consisted of Very Stony Land (rVS) and Uma Rocky Loamy Coarse Sand (URD) (Foote et al. 1972). Very Stony Land consists of “young Aa lava that has a thin covering of volcanic ash that locally extends deep into cracks and depressions” (Foote et al. 1972:124).

D. Methods

Background research included a review of previous archaeological studies on file at the State Historic Preservation Division of the Department of Land and Natural Resources, a review of geology and cultural history documents at Hamilton Library at the University of Hawai‘i, the Hawai‘i State Archives, the Hawai‘i Public Library, and the Archives of the Bishop Museum. Further research included a study of historic photographs at the Hawai‘i State Archives and the Archives of the Bishop Museum and a study of historic maps at the Hawai‘i State Archives, the Archives of the Bishop Museum, and the Survey Office of the Department of Accounting and General Services. Information on Land Commission Awards was accessed through Waihona Aina Corporation’s *Mahele* Data Base (Waihona ‘Aina Corporation <www.waihona.com>).

A complete pedestrian inspection of the project corridor was completed on October 20-21, 2003 by three CSH archaeologists, David Shideler, M.A., Tanya Lee-Greig, M.A., and Todd Tulchin, B.S., under the overall supervision of Hallett H. Hammatt, Ph.D. During the background research for the project area, it was ascertained that much of the property had previously undergone land modification associated with ranching activities, and thus much of the remains of any archaeological value may have been destroyed. The survey was conducted by traversing the previously surveyed and staked waterline corridor with approximately 5-10 m spacing between the two archaeologists. The very low grass groundcover throughout much of the project corridor, due to active cattle grazing, made for excellent visibility.

II. TRADITIONAL AND HISTORICAL BACKGROUND

A. Mythological and Traditional Accounts

Place name analysis can sometimes yield insight into patterns of life in an area. Literal translations of several of the place names for land areas and divisions near to the project area are listed below. Unless otherwise noted, the translations are taken from Pukui et al. (1974).

1. Place Names in the Vicinity

<i>Moku:</i>	Kula:	"plain"
	<i>Ahupua'a:</i>	Kēōkea: "the white sand"
		Kama'ole: "childless" (or "barren"—D. Fredericksen et al. 1994:3)
<i>Moku:</i>	Honua'ula:	"red land";
<i>Ahupua'a:</i>	Paeahu:	"row [of] heaps"
	Palauea	"lazy"; originally spoken with the 'okina by <i>manaleo</i> (native speakers), Palau'ea may also may have been named for the particular type of sweet potato grown in the area (Nathan Napoka, personal communication, 2004)
	Keauhou	"the new era", "the new current"
	Kalihi	"the edge"
	Waipao	"scooped water"
	Papa'anui	"big strong hold" (Pukui and Elbert 1986)
	Kaunuohane	unknown
	Kaloi	unknown
	Kanaio	"the bastard sandalwood tree"

2. Traditional Accounts

In reference to Kula, Pukui (1983) offers several *'ōlelo noe'au* or poetical sayings associated with the lands traversed.

'Āina pua'a a Kukeawe
The pork-eating of Kukeawe

Pukui explains:

Said of a person who is not satisfied with the number of his own pigs and so robs his neighbors of theirs. Kukeawe was a friend of Kahekili who was allowed to help himself to any of Kahekili's pigs in Kula, Maui. But Kukeawe also took the pigs belonging to the people of Kula, Honua'ula, and Kahikinui and plundered their possessions. These people rose in rebellion, led by 'Opū, and surprised the followers of Kukeawe while they were ascending Haleakalā on the way to Kula. Kukeawe's party retreated but found their way blocked by other parties led by

Kawehena, Kaho‘oluhina, and Kuheana. Kukeawe was killed and his body set up at Palauea for all to see. (Saying 88, 1983:12)

A second saying reported by Pukui is:

Kula unahi pikapika he‘e

Kula people, scalers of the sucker of the tentacles of the octopus.

Pukui explains:

Said in fun of the people of Kula, Maui. A Kula chiefess who lived inland did not know what the suckers on an octopus were and tried to scale them as one scales a fish. (Saying 1911: 205)

A third saying reported by Pukui is:

O Kula I ka hoe hewa.

Kula of the ignorant canoe paddlers.

Pukui explains:

Said of Kula, Maui whose people did not know how to paddle canoes because they were uplanders (Saying 2473: 270).

A fifth saying reported by Pukui is:

Na keiki uneune māmane o Kula.

The lads of Kula, who tug and pull the *māmane* up by the roots.

Pukui explains:

An expression of admiration for the people of Kula, Maui, who accomplish whatever they set out to do. (Saying 2238: 245)

A sixth saying reported by Pukui is:

O ka wai kau no ia o Ke‘anae; o ka ‘ūlei ho‘owali‘uwala ia o Kula.

It is the pool on the height of Ke‘anae; it is the ‘ūlei digging stick for the potato [patch] of Kula.

Pukui explains:

A handsome young man of Kula and a beautiful young woman of Ke‘anae, on Maui, were attracted to each other. She boasted of her own womanly perfection by referring to her body as the pool on the heights of Ke‘anae. Not to be outdone, he looked down at himself and boasted of his manhood as the digging stick of Kula.

The above sayings about Kula highlight the fact that Kula was good land for agricultural pursuits. There are several sayings referring to the lack of coastal or sea faring knowledge, which made the people of Kula appear ignorant or stupid. These sayings were rooted in the fact that Kula people live far from the sea and were not familiar with the ways of coastal peoples. The sayings about the seafaring ignorance of Kula people, however, are tempered by sayings of admiration for their skill and perseverance at working the land.

In reference to ‘Ulupalakua and Kanaio, Pukui (1983) makes the following offerings:

Ka ua Lanipa‘ina o ‘Ulupalakua

The sky-crackling rain of ‘Ulupalakua

Pukui explains: “Refers to ‘Ulupalakua, Maui” (Saying 1579, 1983:170)

Kohu'ole kāhi wai o Kanaio
Unattractive is the water of Kanaio

Pukui explains (Saying 1817, 1983:196):

A contemptuous expression meaning that something another person has said or done is worthless. A play on *naio* (pinworm), found in the anus.

Kamakau (1992:142) relates an account of a lesser chief on Maui during the 1780s, with references to Kula, Wailuku, and Kama'ole:

During this period there were disturbances among the country people, not only on Oahu but also on Maui. The trouble arose through one of the lesser chiefs (*kaukauali'i*) named Kū-keawe, a favorite (*aikāne*) of Ka-hekili to whom Ka-hekili had given the privilege of letting his pigs run over the land of Kula and roasting them as he needed them. But he seized also the pigs belonging to the country people of Kula, Honua'ula, and Kahikinui, as far as Kaupō, and went with a large party to rob them of their wealth even with violence. This was the cause of the uprising of the country people called the "Battle of the pig-eating of Kū-keawe" ('Aipua'a-a-Ku-keawe). When the plundering party reached Kaupō they were surprised by some fighting men of Kahikinui, Honua'ula, Wailuku, and Waihe'e . . . they climbed the mountain of Haleakalā in order to descend to Kama'ole in Kula. . . Here they were surrounded by Ka-wehena's men, Kū-keawe was killed, and his body stuck up like an image toward the sea of Palauea.

There are many legends of the swift retribution by Pele, the Hawaiian fire-goddess, on those who dared to offend her. In historic times Pele is believed to have shown her wrath or her favor by sending down destructive lava flows (Beckwith 1970: 190).

B. Pre-Contact Setting

The division of Maui's lands into political districts occurred during the rule of Kaka'alaneo, under the direction of his *kahuna*, Kalaiha'ōhi'a (Beckwith 1970:383). This division resulted in twelve districts during traditional times: Honua'ula, Kahikinui, Kaupō, Kīpahulu, Hana, Ko'olau, Hāmākua Loa, Hāmākua Poko, Ka'anapali, Lahaina, and Kula. The current project corridor is located on the leeward flank of Haleakalā in the traditional districts or *moku* of Kula and Honua'ula (Figure 3). The project corridors cover the *ahupua'a* of Kēōkea and Kama'ole within the *moku* of Kula; in addition to the *ahupua'a* of Paeahu, Palauea, Keauhou I, Keauhou II, Kalihi, Waipao, Papa'anui, Kaunuahane, Kaloi, and Kanaio within the *moku* of Honua'ula. Previous research on pre-contact occupation in the *moku* of Kula and Honua'ula has suggested a bimodal model of permanent residence (Kolb et al. 1997; Cleghorn 1975b; Cordy 1977). Most permanent habitations were in the uplands, separated from a smaller permanent habitation component on the coast by an intermediate barren or transition zone.

1. Settlement of Kula

Kula was famous for its upland 'uala (sweet potato) "plantations" (Handy and Handy 1972:511), due to the combination of fertile soil developed in volcanic ash, cool temperatures and frequent clouds to lower evapo-transpiration and supply moisture as fog drip. Rainfall, distributed fairly evenly throughout the year, would also have allowed for taro cultivation for

subsistence by Hawaiians living in the uplands of Kula on a permanent basis. In contrast, water was notably scarce along much of the coast.

Informants for Handy and Handy (1972:511) in the 1930s placed a "considerable population" on the "lower westward slopes of Haleakala." This information is supported by the findings in the uplands of Kēōkea and Waiohuli of numerous archaeological sites of prehistoric age (Brown and Haun 1989; Kolb et al. 1997). Additional support for this is an abundance of *heiau* - 33 total recorded in the archaeological survey of Maui by Winslow Walker (1931) - in the district of Makawao between roughly the 2000 ft to 3000 ft elevation contours. This provides an image of extensive agricultural fields across open land in prehistoric times, much as Kula appears today. Jarves (in Kuykendall 1965:313) describes the Kula area in July 1846 in the midst of the cash cropping boom of Irish potatoes there:

It ranges along the mountain (Haleakala) between 2000 and 5000 feet elevation, for the distance of 12 miles. The forest is but partially cleared, and the seed put into the rich virgin soil.

This would seem to suggest that prehistoric occupation in Kula was dispersed, possibly with the swidden-type agriculture. Substantial forest clearing does not appear to have occurred until the mid-1800s for commercial agriculture, especially potato and sugar cultivation throughout most of Kula during the *Mahele* period.

2. Traditional Setting of Honua‘ula

The origin of the district name is often associated with the literal translation of Honua‘ula as "red land" (Pukui et al. 1974: 51). However, as Donham (1997: 6-7) points out, the association of the literal translation of Honua‘ula with a district or *moku* would be far more appropriate for other areas of Maui where the soils are distinctively red in color rather than the black lava fields and predominantly dark brown to brown soils of Honua‘ula. A more likely explanation for the origin of the district name is given in Beckwith (1970: 352-353) and summarized in Fornander (1996: 52). Honua‘ula was the name of a traveling companion accompanying Mō‘ikeha on their voyage from Kahiki to Hawai‘i. Mō‘ikeha is of the Maweke chiefly line, and along with the Pa‘ao lineage, it is said that these two families are of great importance to the early colonization of Hawai‘i from North Tahiti. Beckwith (1970: 352, 353) writes:

Olopana settles in Waipio on Hawaii and Lu‘ukia, grand-daughter of Hikapoloa of Kohala, becomes his wife. They are driven out by a flood and retire to Kahiki where some say Moikeha is living, others that he was with Olopana in Waipio. Moikeha becomes infatuated with Lu‘ukia and Olopana raises no objection; but a rival suitor, Mua, who cannot win her favor, pretends to her that Moikeha is defaming her publicly, and she will have nothing more to do with Moikeha. The chief therefore leaves his lands under the care of Olopana and paddles away in a canoe manned by companions whose names, as recorded, are perpetuated as place names on the Hawaiian group. . . . On the journey from the south the party touches first at the easternmost point of Hawaii and the younger brothers remain at

Puna; the kahunas Mo'okini and Ka-lua-wilinau make their home at Kohala; Ho-nua-ula lands in Hana on Maui.

The implication here is that the origin of the name for Honua'ula district may not be in the literal translation of the land as "red earth" but for the traveling companion of Mō'ikeha known as Ho-nua-ula.

a. Settlement of Honua'ula

Extending from the coastline to the summit of Haleakalā, the *moku* of Honua'ula, one of twelve traditional districts on the island of Maui, is situated between that of Kula and Kahikinui. Within Honua'ula *moku* there are 18 additional land divisions, or *ahupua'a*; however, the government survey conducted by Alexander et al. in 1866 (Figure 4), as well as current USGS maps, show few boundaries between the place names, as most of the boundaries were dropped in favor of those for large land grants (e.g. Torbert plantation area, Torbert and Wilcox Grant 234) (Barrere 1975: 41). As a result of this, modern maps show the traditional *ahupua'a* of Keauhou divided in two, with no boundaries for the adjacent *ahupua'a* of Kalihi, Waipao, and Papa'anui.

The *ahupua'a* of Keauhou extends from the coastline to just above Pu'u Makua and likely encompassed the Keauhou section of the LL. Torbert Royal Patent Grant 120 and the LL. Torbert and W. Wilcox Royal Patent Grant 234. According to Pukui et al. (1974), the literal translation of Keauhou is "the new era" or "the new current." Not much information could be found in the available literature on the origins of the name for this particular *ahupua'a*. However, the division of Keauhou into Keauhou I and II deserves closer attention.

A section of Keauhou *Ahupua'a*, approximately 194 acres, was awarded to Hoomanawanui by Land Commission Award (LCA) 6715 in 1852 (Figure 5). In 1856, Hoomanawanui and her husband Hikiau sold the Keauhou land to James Makee for \$1,000 (Barrere 1975: 38). In the deed, this portion of Keauhou is referred to as "Hikiau Keauhou" in order to distinguish it from the government held portion of Keauhou, a section of which included the Torbert and Wilcox Royal Patent Grant 234 (Barrere 1975: 38). It seems apparent that the portion of Keauhou that was awarded to Hoomanawanui and deeded to Makee in 1856 was surveyed by W.D Alexander et al. (Figure 4) as an *ahupua'a* separate from government held Keauhou and perpetuated during the Hawaii Territory Survey conducted by Walter E. Wall in 1923 (Figure 5). The government held section of Keauhou, in addition to Kalihi, Waipao, and Papa'anui were all surveyed as a single *ahupua'a* in favor of Torbert and Wilcox Grant 234, thus explaining the modern *ahupua'a* of Keauhou I and Keauhou II and the lack of land divisions between Kalihi, Waipao, and Papa'anui.

In 1850, under Royal Patent Grant 234, Linton L. Torbert and William Wilcox purchased 1,986 acres at one dollar per acre. The main purpose of this purchase was for the cultivation of Irish potatoes in an effort to cash in on the "potato boom" of the California Gold Rush. In 1851, however, Linton Torbert faced bankruptcy, and in an effort to avoid financial ruin assigned his holdings by trust deed to Captain James Makee (Fredericksen and Fredericksen 1998: 10). At auction, conducted by his own order, Captain Makee purchased all of the Torbert holdings on January 23, 1856 (Fredericksen and Fredericksen 1998).

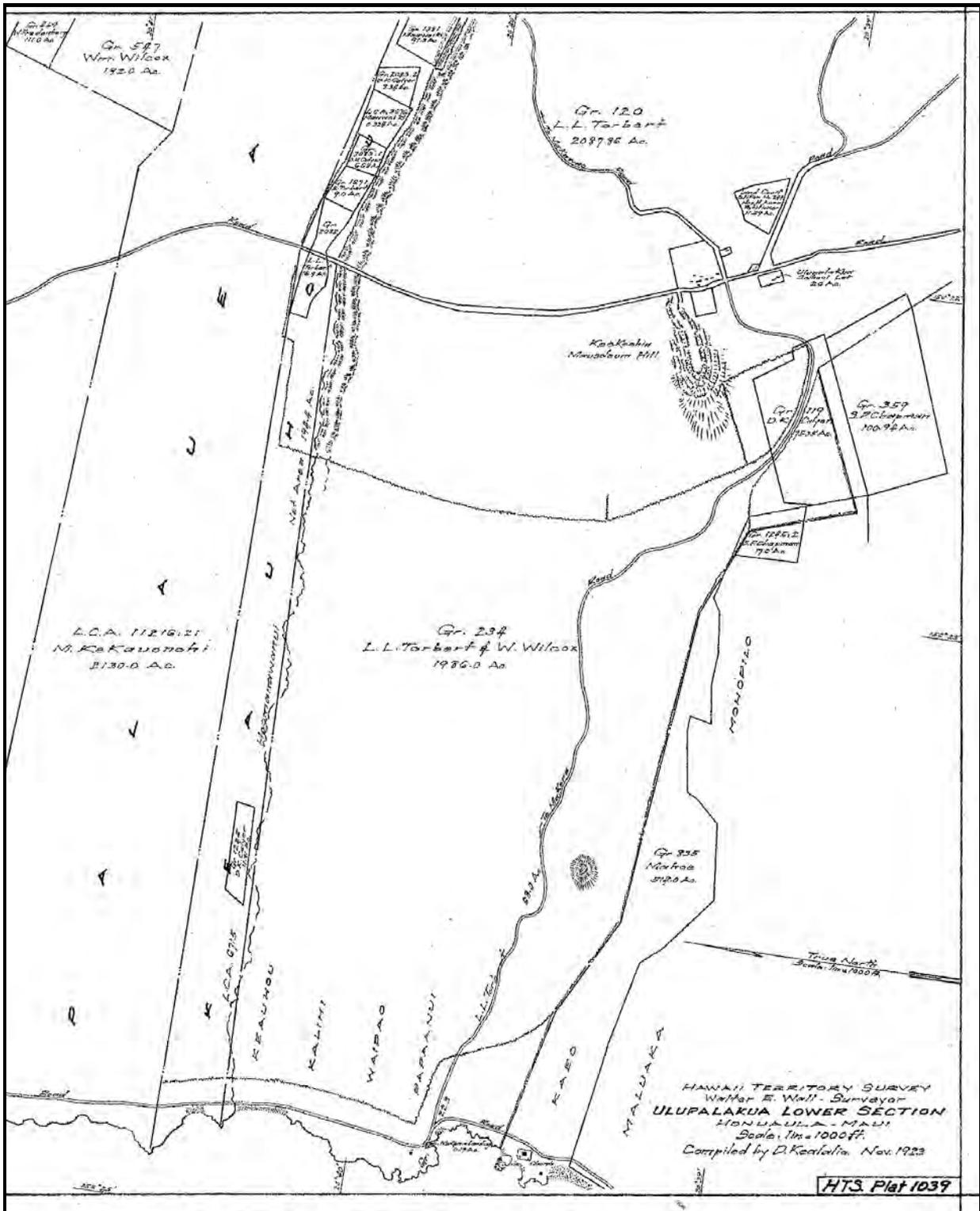


Figure 5 1923 Map of Ulupalakua Lower Section, Hawaii Territory Survey, Water E. Wall Surveyor.

b. Traditional Subsistence of Honua‘ula

The core written sources for summarizing the traditional subsistence practices for this area of Maui are found in *Waile‘a: Waters of Pleasure for the Children of Kama* by Barrere (1975), *Native Planters* by Handy and Handy (1972) and the *Native Hawaiian Ethnographic Study for the Hawai‘i Geothermal Project Proposed for Puna and Southeast Maui* by Matsuoka et al. (1996). Handy and Handy write:

All the country below the west and south slopes of Haleakala, specifically Kula, Honua‘ula, Kahikinui, and Kaupo, in old Hawaiian times depended on the sweet potato. (S)ome upland taro was grown, up to an altitude of 3,000 feet . . . (t)here was excellent deep-water fishing available to the folk of Kula and Honua‘ula [Handy and Handy 1991: 276].

Matsuoka et al. (1972) imply that the people of southeastern Maui followed a seasonal settlement pattern dependent upon the variations in rainfall. Based on oral testimony, it was established that inhabitants of this area lived at upland habitations, where planting could be done year round, during the dry period and migrated to the lowland coastal region during the rainy season. In the lowland areas, planting was done in conjunction with the rainy season where each family cultivated plants at habitation sites along the coast (Matsuoka et al. 1996: 73). The eastern and coastal portion of Honua‘ula was thickly populated by Hawaiian planters (Handy and Handy 1972). Matsuoka et al. write:

The entire area of Honua‘ula was highly cultivated ... It is important to note that later, when lava flows covered the land, people did not move away. Instead, they dug deep holes in the lava and transported soil from the uplands to fill them up. The earth was dug up and the soil passed in baskets from hand to hand along a row of people to fill the “garden holes” in the lava [Matsuoka et al. 1972: 74].

The use of these “garden holes” as an effective agricultural practice in an otherwise marginal environment is underscored by claims for such areas in testimony to the Land Commission. In the testimony of Kekualike, he lays claim to five *moku mau‘u* “the best places for cultivation in our land (Honua‘ula).” Paaluhi laid claimed to one *moku mau‘u* at Papa‘anui, and Kaumana claimed four. The translator notes that there is no data on the term *moku mau‘u* but believes it refers to an arable pocket of soil in rocky terrain. As attested to by Le Pouse (1798: 345), there was some animal husbandry practiced in the Honua‘ula area along with cultivation of bananas and dry land taro. However, the primary subsistence practices in this leeward environment centered on fishing and sweet potato cultivation.

C. Historic Economy and Land Use

The most significant marker in the change of land-use patterns and allocation came with The Great *Mahele* of 1848 and the privatization of land in Hawai‘i. This action hastened the shift of the Hawaiian economy from that of a subsistence-based economy to that of a cash-based economy. During the *Mahele*, all the lands in the Kingdom of Hawai‘i were divided between *mō‘ī* (king), *ali‘i* and *konohiki* (overseer of an *ahupua‘a*), and *maka‘āinana* (tenants of the land) and passed into the Western land tenure model of private ownership. On March 8, 1848, Kamehameha III further divided his personal holdings into lands he would retain as private holdings and parcels he would give to the government. This act paved the way for

government land sales to foreigners, and in 1850 the legislature granted resident aliens the right to acquire fee simple land rights (Moffat and Fitzpatrick 1995: 41-51). In many cases these land sales to foreigners were vast and often encompassed entire *ahupua'a* and *'ili*, such as the case at Keauhou, Kalihi, Waipao, and Papa'anui with the Torbert Grant 120 and the Wilcox and Torbert Grant 234.

1. Historic Kula

In 1820, the whaling industry was introduced in Hawai'i. Although the immediate whaling activities centered on Lahaina, the Kula area felt the effects in the form of increased agricultural demands. The introduction of whaling to the Maui community brought with it an increased demand for foodstuffs, and in particular the long-lasting Irish potato. As a result, after 1830, dry-land agriculture in the Kula District expanded with a particular focus on Irish potatoes. The California Gold Rush of 1849 added an additional demand as a California-Hawaii potato trade began to flourish. Kula came to be known as "the potato district" (the area between 2000 and 5000 ft amsl) as it was the area of highest potato production in the Kingdom. From 1830 to 1850, potato production thrived in Kula, until successful potato cultivation and production in California and Oregon resulted in a decline in the Hawai'i trade (Burgett and Spear 1995:6-7). Donham (1992:5) notes that the increase in land clearing and cultivation associated with the Gold Rush resulted in "deforestation [which] adversely affect[ed] the amount of rainfall in the district", and periods of drought became more common.

The increase in agricultural production associated with the potato industry encouraged many Hawaiians to venture into cash-crops (Speakman 1984:116) and attracted Chinese immigrants to Kula in the 1840s. During the subsequent 30 to 40 years, the Chinese created a thriving community in the uplands (Burgett and Spear 1995:7). According to Speakman (1984:140), even though the Kula land was hard, with scattered rains and common droughts, "the Chinese who lived and worked around Kēōkea enjoyed the healthiest climate to be found almost anywhere. They also enjoyed themselves and became good friends and neighbors of the Hawaiians living there."

During this time period, sugar cultivation and ranching were also established in the Kula region. Sugar was present prior to 1846, with six sugar producers operating on the slopes of Haleakalā (Wong Smith in Brown and Haun 1989: C-7). As Wong Smith points out (Brown and Haun 1989:C-6), ranching was present in the area prior to the 1840s, and along with agriculture, would continue to be important activities in the Kula area. During the 1970s, Kula produced the majority of Hawai'i's locally grown produce, and livestock ranches comprised most of the remaining land use. At present, non-residential areas are still in use as centers of agricultural production, particularly in the "potato district" of Kula (Donham 1992:5).

2. Historic Honua'ula

With vast holdings in Honua'ula, Linton Torbert established the Torbert Plantation, which accelerated the Irish potato boom in Honua'ula and catered to the California Gold Rush. The Torbert Plantation holdings included a road and landing at Mākena to expedite shipping. As in the Kula area, the historic agricultural boom in Honua'ula attracted Japanese immigrants to the Ulupalakua and Kanaio area. Unlike the open pastures of the modern era, the hills of 'Ulupalakua were historically covered in *pamakani*. This fuzzy vine made raising horses, grazing cattle, and farming the land difficult. As a means to clear the forest and *pamakani*

ground cover in the early 1900s, large landholders in the upland areas handed out agricultural leases on parcels cleared by immigrant and local labor.

Then in 1856, as previously discussed, Captain James Makee purchased the Torbert holdings, established Rose Ranch in 1864, and changed Makena into one of the main ports on Maui (Fredericksen and Fredericksen 1998: 10). By 1865, Honua‘ula residents had adapted to the changing economic structure of Hawaii and were either employed by Rose Ranch or McPhee. Families had settled in permanent structures either along the coastline or near the ranch at ‘Ulupalakua and occupied these settlements year round rather than seasonally. Economically, the upland inhabitants depended on ranching and agriculture. For the coastal inhabitants, it seems that traditional fishing and agricultural practices continued into the early twentieth century with few modifications, as a supplement to paying jobs.

After the development of Kahului Harbor in the 1920’s, commercial shipping at the Makena Landing ended, and the area saw a decline in population. Finally, with the onset of World War II, the population of Makena suffered additional population decline, and shoreline habitation in Honua‘ula changed.

Military activities, including amphibious beach landings were conducted all along the coastline, around and after the World War II era. The military also graded roads from Kīhei to Mākena, sometimes following an old horse trail. A more direct impact of the war and military on the population and residents of coastal and upland Honua‘ula was the purchase or confiscation of lands along the shore. The implication of this is that while the coastal regions of Honua‘ula experienced a decline in population, the upland region of ‘Ulupalakua and Kanaio saw a slight increase in population.

D. Summary

Mythology regarding this portion of Maui is relatively scarce and traditional accounts focus on political activities. Accounts record the struggles and activities of Maui and Hawai‘i chiefs in the 1700s, including Ke-kau-like, Alapa‘i, Ka-hekili, Kū-keawe, ‘Umi, and also British Captain Vancouver. The sand beaches along Kīhei’s shores were used as landing and staging areas during these armed conflicts.

During the early historical period, Kula's agricultural role was expanded as the introduction of whaling in 1820 and the California Gold Rush of 1849 created a demand for the Irish potato, which was cultivated in the uplands. The traditional *‘uala* planting grounds were now also used for the Irish potato, and the area became known as the “potato district.” Immigrants from China came to Makawao during this time and created a thriving community in Kula. Sugar cultivation and ranching were also introduced into Makawao in the early 1800s.

Many of the people who had claims in Kula had the chiefly status that allowed them to actively engage in the international economy, which was potatoes for cash. Kalepolepo flourished as a major entrepreneur in the period from the 1830s to the mid 1870s.

The late 1800s were marked by the continuation of ranching and sugar in Makawao. Lower Kula consisted primarily of pasture land by the end of the century. By the late 1800s, Hawaii Commercial and Sugar Company became a major presence in Makawao with its absorption of other neighboring operations.

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

Numerous archaeological studies have been conducted within the *ahupua'a* of Kama'ole, Paeahu, Palauea, Keauhou, and Kanaio. However, the bulk of these studies have been concentrated in the coastal areas, related to development in the greater Makena, Wailea, and Kama'ole Homestead areas (Figure 6). Few archaeological studies have been conducted in the vicinity of the current project corridor. Because of the paucity of studies in the immediate area, a summary of studies conducted in the coastal areas of the appropriate *ahupua'a* is presented. The studies that are more relevant and that can be used to predict the site types that are likely within the current project area are summarized below.

A. Summary of Previous Archaeological Studies

Archaeological studies on Maui began in the early 1900s with very broad studies focused on large, impressive sites such as *heiau* (religious structures) (Table 1). The first comprehensive archaeological survey of the island of Maui was conducted by Winslow Walker in 1931. Walker documented 266 sites on Maui, mostly focusing on *heiau*. No sites were recorded in Palauea, Paeahu, or Keauhou *Ahupua'a*. In the Honua'ula District, he documented ten coastal *heiau*, four upland *heiau*, a coastal village, two fishponds, and a number of *ko'a* (fishing shrines). Within Kanaio *Ahupua'a*, Walker recorded 12 house sites and associated cultivated *kipuka* on the trail to Kanaio, burial platforms near the coast, and segments of the Hoapili Trail. In addition, Walker also recorded Site 188 (an unnamed *heiau*), Site 189 (Kohala Heiau), Site 190 (Manonokohala Heiau), Site 191 (Manokaahia Heiau), and Site 192 (Papanuiokane).

1. Inland Kama'ole through Kanaio

In a field report included in Walker's *Archaeology of Maui* (1931), Bruce et al. (1972) report on findings related to an archaeological study in the Kanaio area. The purpose of this study was to locate and photograph Walker Sites 188-192. The following is a description made of the Kanaio project area:

The land at Kanaio, in the vicinity of the Congregational Church, is exceedingly rocky. Stone walls are everywhere. It appears that there area many unrecorded sites in the area [Bruce et al. 1972 in Walker 1931].

The only identified site in the immediate vicinity of the current project corridor was a platform tentatively identified as Walker Site 189, Kohala Heiau (Figure 7). The location of the site is described as:

On the inside turn in the road, looking mauka [inland], South of the Kula Pipeline and at the South corner of the eucalyptus grove – where the road turns and runs on a lateral between the eucalyptus grove and the reservoir [Bruce et al. 1972 in Walker 1931].

The Kohala Heiau (Walker Site 189) is described as:

A rough platform of basalt blocks on the end of a high ridge overlooking the sea. Its greatest length is 53 feet and width 34. The front has been built up into a terrace

Table 1 Previous Archaeological Studies Not Depicted on a Map Due to Lack of Accurate Location Information.

Study #	Author	Year	Ahupua'a	TMK	Results
	Stokes	1918	Island-wide	--	Heiau Documentation: Heiau of Nanahu, land of Mākena; on the point north of Mākena Bay. This was a pavement of 'a'ā and coral fragments, level with the surrounding ground and rocks, and about 20 feet square. The only information to be gathered was that it was "a <i>heiau</i> for dead people." It was not a graveyard, and I do not understand nor could the local people explain to me the meaning of their description. Heiau of Wailuku, at Kawililipoa, land of Kama'ole, inland; said to be a platform. Not seen. Heiau of Kolea, at Kawilipoa, land of Kama'ole, Said to have been for human sacrifice Not seen. Heiau at Kawililipoa, land of Kama'ole; between the road and the beach. This foundation, which had been destroyed, was probably a platform originally. It was situated on a sandy flat; quarter of a mile from the sea; 200 feet west of the road, and from 200 to 3000 feet south of the Mormon church.
	Thrum	1918	Islandwide	--	Heiau Documentation: Heiau Mo'omuku, for sacrifice; between Makawao and Kula. Not seen. P.126; Nanahu Heiau, on point, north of landing at Mākena. A pavement of pebbles and some coral, about twenty feet square and level with ground. No other features. Said by several natives to be a heiau "for dead people." Probably only a sacred place without temple structure. p. 127-128.
	Thrum	1921	Islandwide	--	Heiau Documentation: Kalailani, Ke'ekeehia, and Kamahina, as also Kalaniana at Keawakapu, were <i>heiau</i> in the 'Ulupalakua section in olden time. They are all gone. The <i>heiau</i> known as Wailuku, in Kama'ole, Kula (formerly reported), was visited and found to be of the platform-type, some 40x60 feet in size, in ruins. Its upper end showed a slow terraced wall, while the lower wall must have been ten feet high in its day. This <i>heiau</i> is held to be of the <i>po'okanaka</i> class, and is much revered for the alleged frequency of drum and other sound emanating from there on the nights of Kane.

Study #	Author	Year	Ahupua'a	TMK	Results
	Walker, W.	1931	Islandwide	--	Large Monument Site Documentation: Documented 266 sites on Maui, mainly <i>heiau</i> . In Kama'ole, he recorded five <i>heiau</i> : Wailuku (205), Kolea (206), Keahialoa (208), Papakea (209) and an unnamed structure (207). In Honua'ula, he documented ten coastal <i>heiau</i> , four upland <i>heiau</i> , a coastal village, two fishponds, and a number of <i>ko'a</i> . No sites were recorded in Palauea, Paeahu or Keauhou. From Keauhou to Ka'eo, he recorded Nanahu <i>Ko'a</i> , Site 197 (Pōhakunahaha Heiau), and Sites 200-204 (Heiau Kalailani, Keekeehia, Kalaniana, and Kamahina). In Kanaio, he recorded 12 house sites and associated cultivated <i>kipuka</i> on the trail to Kanaio, burial platforms near the coast, and described segments of the Hoapili Trail. Walker recorded in Kanaio: Site 188 (an unnamed <i>heiau</i>), Site 189 (Kohala Heiau), Site 190 (Manonokohala Heiau), Site 191 (Manokaahia Heiau), Site 192 (Papanuiokane).
	Bruce	n.d. [1973]	Islandwide	--	Site Documentation: Descriptions of selected sites.
	Cordy	1977	Kīhei to Paeahu	--	Reconnaissance Survey: 38 sites were identified in all; 13 north of Kama'ole, 12 in Kama'ole (Site 1713-1724) and 13 (Sites 1725-1733, 1735-1737) in Paeahu. Cordy proposed four habitation zones, coastal, barren, transitional, and inland.
	Sterling	1998	Islandwide	--	Site Documentation: Sterling noted in Kanaio a <i>mauka-makai</i> trail, several <i>ko'a</i> , a lava tube with human remains, several unnamed <i>heiau</i> , the villages of Waialio, and Walker's site 188, 189, 190, 191, and 192, all <i>heiau</i> . From Ka'eo to Keauhou, she recorded the Nanahu <i>Ko'a</i> first recorded by Walker, and Walker's Sites 197, 200-204, all <i>heiau</i> . In Palauea, she recorded a <i>ko'a</i> .

Table 2 Previous Archaeological Studies Depicted on MAP 1 (Figure 6)

Study #	Author	Year	Ahupua'a	TMK	Results
1	Haun	1988	Kama'ole	2-2-02: 02 por.	Reconnaissance Survey of the Maui Palisades Parcel: Identified 33 sites with 68 features, mostly military. This area was revisited by Mayberry & Haun in 1988.
2	Mayberry & Haun	1988	Kama'ole	2-2-02: 02 por.	Reconnaissance Survey: Identified 33 sites in an area first surveyed by Haun (1988).
3	Kennedy	1990b	Kama'ole	2-2-02: 24	Inventory Survey of a Parcel at 300 ft amsl: No archaeological findings.
4	Fredericksen, E., & D. Fredericksen	1999	Kama'ole	2-2-02: 69 por.	Inventory Survey of a parcel at 170 ft. elevation: 3 sites were identified, including 5 small enclosures and a rock pile.
5	Fredericksen, D., and E. Fredericksen	2000	Kama'ole	2-2-02: 69 por.	Data Recovery: Six test units were excavated into an enclosure at Site 50-50-10-4227. Several artifacts were recovered within an enclosure, including many coral file tips, suggesting that fishhook manufacture was taking place at this site.
6	Chapman & Kirch	1979	Kanaio	2-1-02	Data Recovery: Excavations were conducted at seven sites. Site M8 was dated to the mid-15th century; it had early artifact types that suggested it was the earliest site, possibly dating to A.D. 1100.
7	Howarth	1993	Kanaio	2-1-02	Reconnaissance Survey at KNTA: Three caves surveyed, including Site 50-50-14-3912; human remains found in one cave and the beak of an extinct <i>'akialoa</i> -like bird.
8	Major	1993	Kanaio	2-1-02	Reconnaissance Survey at KNTA: An archaeologist accompanied several biologists on a cave survey; five caves (50-50-14-3912, 3911, 3918, 3909, 1235) had significant archaeological remains, including burials.

Study #	Author	Year	Ahupua'a	TMK	Results
9	Bordner	1994	Kanaio	2-1-02	Site Documentation of sites in KNTA: Recorded over 100 sites in Kanaio and 'Auahi; no site numbers were assigned; Habitation and agriculture focused on Kanaio village near Honua'ula Church and extending down to Pu'u Pimoe. Habitation in coastal Kanaio focused on Alaha-Wahene [Site 50-50-14-3796] on west Kanaio and a second cluster at Wai a Ilio [Site 50-50-14-1481]. The coastal communities were linked by Pi'ilani [Hoapili] Trail and both had trails heading <i>mauka</i> to Kanaio; religious sites around Kanaio; also cluster in eastern Kanaio Homesteads property.
10	Erkelens	1994	Kanaio	2-1-02	Inventory Survey of road corridor: 51 sites with 233 features recorded.
11	Nees and Williams	1996	Kanaio	2-1-02	Inventory Survey in KNTA (4 parcels): Seven sites with over 17 features were recorded; three features were possible burial features. Other features were related to pre-contact temporary habitation and post-contact ranching.
12	Eble & Cleghorn	1997	Kanaio	2-1-02	Reconnaissance Survey of KNTA lands (6000 acres): 42 registered sites (50-50-14-572, 1006, 1235, 1481, 1800, 3780-3918) (20% of installation surveyed) were recorded, consisting of pre-contact Hawaiian habitation and agriculture and historic agriculture and cattle ranching features. Eight dates from A.D. 1325-1600 to A.D. 1705-modern were determined.
13	Eble & Tolleson	1999	Kanaio	2-1-02	Inventory Survey and Monitoring of KNTA lands (293 acres). 22 sites (50-50-14-4732 to 4752) with 183 features; at least two had burials.

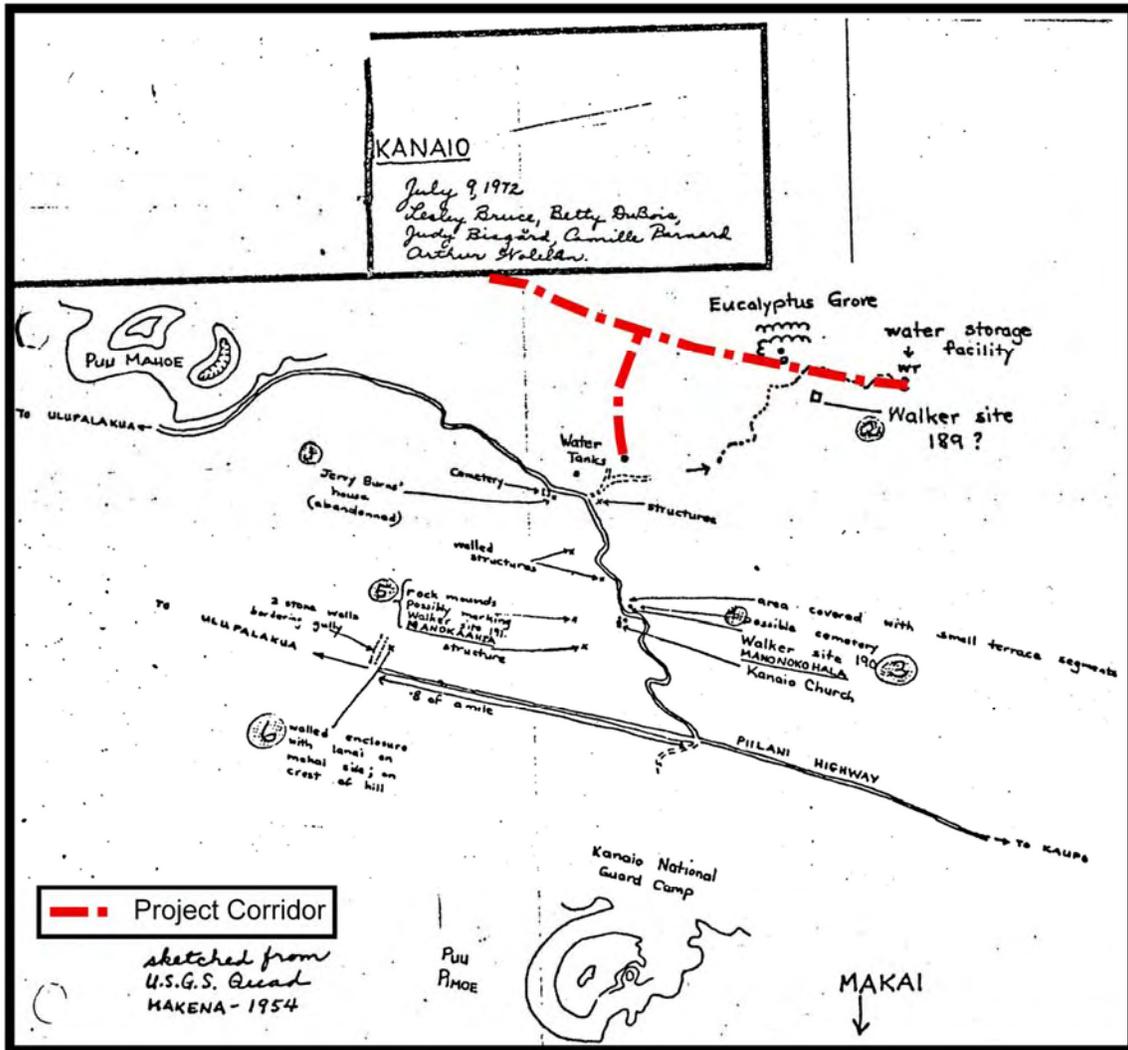


Figure 7 Kanaio Area Site Map from Bruce et al. 1972 (in Walker 1931).

3 feet high extending for 23 feet. But the stone pavement only extends 8 feet back, the remainder is the natural hill level. The western side is also stone faced but there are not true walls. No coral or pebbles were seen. The hill extends for some distance level in front of the platform and some of the open space may have been included in the *heiau* confines [Walker 1931:259].

Additional work in the Kanaio area was conducted at the Hawai'i Army National Guard Kanaio Training Area (KNTA), *makai* of the Pi'ilani Highway (Figure 6, Table 2). Reconnaissance and inventory surveys (Howarth 1993; Major 1993; Bordner 1994; Erkelens 1994; Nees and Williams 1996; Eble and Cleghorn 1997; Eble and Tolleson 1999) located many sites including prehistoric habitation, agricultural, and burial features, caves containing significant archaeological remains including burials, and historic ranching infrastructure. Bordner (1994) observed through archaeological evidence that habitation and agriculture was focused on Kanaio Village near Honua'ula Church extending south to Pu'u Pimoe (*makai* of the Pi'ilani Highway). Habitation was also clustered at the coast. Excavations made in the KNTA area (Chapman and Kirch 1979; Eble and Cleghorn 1997) produced samples dated from A.D. 1325-1705, though artifact types suggested possible occupation circa A.D. 1100.

Within Kama'ole Ahupua'a, reconnaissance surveys (Haun 1988; Mayberry and Haun 1988) identified 33 sites within the Maui Palisades project area. The bulk of these sites were military related. However, C and U-shaped structures, enclosures, terraces, and modified outcrops were also identified indicating prehistoric habitation and agriculture in the area.

2. Coastal Kama'ole

Archaeological studies in the coastal Kama'ole area (Figure 8, Table 3) indicated prehistoric utilization of the area for habitation and agricultural purposes. Reconnaissance and inventory surveys of various parcels located sites including walls, rock shelters, midden scatters, habitation sites, religious sites, and burials (Sinoto 1989; Hammatt & Shideler 1992; Kennedy 1992; Kennedy et al. 1992; Folk et al. 1999). Data recovery excavations made by Burgett et al. (1996) yielded radiocarbon dates indicating traditional habitation in the area spanning from the thirteenth century into the early historic period.

3. Inland Paeahu to Papa'anui

Archaeological studies have covered a significant portion of the *makai* areas of Paeahu, Palauea, Keauhou, Kalihi, Waipao, and Papa'anui Ahupua'a (Figure 9, Table 4). Reconnaissance and inventory surveys conducted in Paeahu Ahupua'a identified sites including human burials, C-shaped structures, walls, habitation sites and agricultural sites (Walton 1972; Spear 1987; Klieger et al. 1992; Sinoto et al. 1999b). Data recovery excavations by Landrum and Cleghorn (1989) produced radiocarbon dates of A.D. 1680-1860 and A.D. 1520-1620.

Within Palauea and Keauhou Ahupua'a, reconnaissance and inventory surveys located a relatively high density of pre-contact archaeological sites. Archaeological studies at the Murray Pacific project area (Haun 1987b; Shapiro and Haun 1989; Toenjes et al. 1992; Toenjes et al. 2000) located sites including c-shaped structures, habitation sites, midden scatters, agricultural sites and a possible *heiau*. Radiocarbon dates indicated a long occupation of the site possibly as early as A.D. 1161 and continuing into the early historic period (Toenjes et al. 1992). Archaeological studies at the Wailea 670 project area identified sites including stepping stone trails, enclosures, and multi-feature complexes generally related to temporary habitation during

Table 3 Previous Archaeological Studies Depicted on MAP 2 (Figure 8)

Study #	Author	Year	Ahupua'a	TMK	Results
14	Fredericksen, D., et al.	1994	Kama'ole	3-9-30: 21	Inventory Survey: 2 sites were identified including a midden scatter & a concrete slaughterhouse foundation.
15	Pantaleo	2002	Kama'ole	3-9-17: 34	Inventory Survey: No surface features remained in this heavily disturbed 14-acre parcel. Fifteen backhoe trenches were excavated, but no subsurface cultural deposits were found.
16	Tome & Dega	2002a	Kama'ole	3-9-17: 31	Inventory Survey: One site (50-50-10-5192) with four features was identified, consisting of an alignment and three midden scatters. The site was interpreted as a pre-contact habitation site.
17	Burgett and Spear	1996	Kama'ole	3-9-17: 02, 68, 69	Inventory Survey: One site (State Site 50-50-09-4400) with a stone alignment, a pit feature, and two cultural deposits was recorded. Sparse midden and a few lithics were recovered from test units.
18	Haun & Henry	2000	Kama'ole	3-9-16: 01, 07, 08, 09	Inventory Survey: No surface remains were found in this 1-acre parcel. The north half of the property had been buried under fill.
19	Sinoto	1989	Kama'ole	3-9-18: 01	Inventory Survey: Identified 8 sites, including walls, a possible trail, a rock shelter, and midden.
20	Fredericksen, E., et al.	1994a	Kama'ole	3-9-18: 01	Inventory Survey: 11 sites, consisting of 8 previously identified sites (50-50-10-3531-3541) and three newly identified sites were recorded.
21	Hammatt & Shideler	1989	Kama'ole	3-9-18: 17, 21; 3-9-19: 06; 3-9-20: 20, 27	Reconnaissance Survey of a 54-acre parcel: Identified 8 sites.
22	Hammatt & Shideler	1992	Kama'ole	3-9-18: 17, 21; 3-9-19: 06; 3-9-20: 20, 27	Inventory Survey of a 54-acre parcel: Survey & Testing of Hammatt & Shideler 1989 study area. Identified 2 probable <i>ko'a</i> shrines (Sites 50-50-10-2633 and 2637) among 8 sites.
23	Pantaleo & Sinoto	1991a	Kama'ole	3-9-19: Lot 1-2	Assessment: Nine sites were located, including two historic structures, one occupied between 1910-1930. One platform (Site T-1) had previously been tested by Hammatt & Shideler (1990).

Study #	Author	Year	Ahupua'a	TMK	Results
24	Pantaleo et al.	1991	Kama'ole	3-9-19: 04, 07	Inventory Survey: Covered part of same area as Hammatt & Shideler 1989, 1991.
25	Leidemann	1989	Kama'ole	3-9-14: 02	Reconnaissance Survey: No archaeological findings, area extensively bulldozed.
26	Kennedy	1991	Kama'ole	3-9-13: 01, 10	Reconnaissance Survey: No surface features were noted in this 5.8-acre parcel.
27	Kennedy	1989b	Kama'ole	3-9-04: 134	Reconnaissance Survey of a 16.4-acre parcel: No archaeological findings.
28	Kennedy	1989a	Kama'ole	3-9-04: 132, 135	Inventory Survey: No archaeological findings judged significant.
29	Fredericksen, W., et al.	1992a	Kama'ole	3-9-04: 79	Data Recovery: Further work was conducted at Sites 50-50-10-2903, a rock wall, 2901, an historic structure, and 2902, a midden scatter. A human cranial fragment was noted on the ground surface at Site 2902. Thirty-three trenches were excavated in the project area. No additional human bone was found at Site 2902.
30	Kennedy	1992	Kama'ole	3-9-04: 79	Inventory Survey: Identified 4 sites (State site 50-50-10-2900 to 2903) including a permanent pre-contact habitation/religious site (2900) in this 10 acre parcel.
31	Kennedy et al.	1992	Kama'ole	3-9-04: 76, 77, 78	Inventory Survey: Four sites were recorded, a midden (50-50-10-3123) and three historic walls (3124-3126). 29 trenches and 12 shovel tests were excavated around the sites; no significant cultural deposits were found.
32	Sinoto et al.	1999a	Kama'ole	3-9-04: 129	Inventory Survey of the Douglas Spencer Subdivision: One wall segment was recorded (no state site number). No cultural deposit was noted during backhoe trenching.
33	Fredericksen, W., et al.	1991b	Kama'ole	3-9-17: 26	Inventory Survey: No significant archaeological findings (only modern trash).
34	Rotunno-Hazuka & Pantaleo	1991	Kama'ole	3-9-17: 23 Lot 1-B	Reconnaissance Survey of the Diamond Resort Parcel: No archaeological findings. The parcel showed evidence of grubbing and was covered with dense vegetation.

Study #	Author	Year	Ahupua'a	TMK	Results
35	Sinoto	1990	Kama'ole	3-9-17: 23, Lot A & B	Reconnaissance Survey: No archaeological findings.
36	Haun & Henry	2001c	Kama'ole	3-9-03: 05	Inventory Survey: No features were found. The ground had been disturbed.
37	Keau	1981a	Kama'ole	3-9-12: 13	Reconnaissance Survey at Kalama Park: One possible <i>ko'a</i> (fishing shrine) and one possible burial site were recorded.
38	Donham	1990c	Kama'ole	3-9-12: 13	Inventory Survey at the Kihei Public Library Project Area: No surface features were located in this 19.3 acre parcel. No cultural material was found in a series of auger tests. Only modern refuse was noted.
39	Burgett et al.	1996	Kama'ole	3-9-12: 13	Monitoring and Data Recovery at the Kihei Public Library Project Area: Five sites were identified; 50-50-10-3998 and 3999 are habitation sites; Site 3942 was a habitation site and <i>ko'a</i> ; Site 3944 was a habitation with possible burial and site 4000 was a scatter of human remains. Radiocarbon dates indicated that habitation stretched from the 13th c. into historic times.
40	Keau	1981b	Kama'ole	3-9-05	Reconnaissance Survey of Kama'ole Beach Park: No archaeological findings. Recent storms did not expose any cultural deposits.
41	Shapiro & Rosendahl	1988	Kama'ole	3-9-05: 52	Reconnaissance Survey: Four backhoe trenches were excavated in the parcel. No cultural deposit was found.
42	Neller	1982	Kama'ole	3-9-12: 13; 3-9-05: 52	Reconnaissance Survey: Although no burials were found during the reconnaissance survey, the archaeologists were told that a burial had been found at the park in 1981 during construction activities and a "large number of burials" had been found during construction of the playing field.
43	Fredericksen, E., & D. Fredericksen	2001	Kama'ole	3-9-20: 34, Lots A-2-B	Inventory Survey: A cultural deposit with food midden (Site 50-50-10-5170) was discovered during subsurface testing. A radiocarbon date (220 +/-50 BP dated the site to the late pre-contact early historic period.
44	Neller	1982	Kama'ole	3-9-20: 21	Reconnaissance Survey: construction trenches at Kama'ole.
45	Fredericksen, W., et al.	1989	Kama'ole	3-9-20: 10	Inventory Survey: No surface or subsurface features recorded.

Study #	Author	Year	Ahupua'a	TMK	Results
46	Fredericksen, W., et al.	1991a	Kama'ole	3-9-05: 19	Inventory Survey: No significant archaeological findings (2 modern dog burials and a modern trash pit).
47	Hammatt & Shideler	1990	Kama'ole	3-9-20: 09	Reconnaissance Survey: No archaeological findings in this 4-acre parcel.
48	Fredericksen, W., et al.	1990	Kama'ole	3-9-20: 07	Inventory Survey: No archaeological findings.
49	Kennedy	1990a	Kama'ole	3-9-04: 05 por.	Inventory Survey: One wall was recorded, probably constructed in the early historic period.
50	Fredericksen, W., et al.	1992b	Kama'ole	3-9-05: 03, 04	Inventory Survey: Backhoe trenching was conducted in a sand dune. There was no cultural deposit.
51	Fredericksen, E.	2002	Kama'ole	3-9-04: 48	Monitoring Report: During monitoring of the 5.86 parcel, two human bone fragments were found.
52	Haun & Henry	2001a	Kama'ole	3-9-04: 01 por., 61 por.	Inventory Survey: Four sites (50-50-10-1034, 3522, 3523, 3524), previously recorded by Sinoto (1978) were relocated in this 8-acre parcel. 59 trenches were excavated in the project area; 39 shovel tests and 7 test units were excavated at Site 1034, the Kama'ole House Site.
53	Calis	2001	Kama'ole	3-9-04: 01 por., 61 por.	Inventory Survey of the Kama'ole Beach Park: Backhoe trenching was conducted in a sand dune. There was no cultural deposit.
54	Sinoto	1978b	Kama'ole	3-9-04: 01, 67, 87	Reconnaissance Survey: Recorded 6 sites (later consolidated into State sites 50-10-10-3522-3524) and relocated one site (1034), the Kama'ole House Site.
55	Cox	1976	Kama'ole	--	Reconnaissance Survey of road corridor in barren zone. Six sites (50-50-09-219-224) were identified in the road corridor; only 224 (cave shelter) is in Kama'ole; limited excavations were conducted at sites 219 (<i>ahu</i>) and 224; one volcanic rind date of A.D. 1724-1784 was determined for Site 224.
56	Folk et al.	1999	Kama'ole	2-2; 2-3	Reconnaissance Survey: 23 sites were recorded during the survey, five sites are in Kama'ole: CSH 9 (complex of 30+ features), 10 (enclosure), 11 (wall), 12 (wall and <i>ahu</i>), and 14 (mound).
57	Fredericksen, E., et al.	1994b	Kama'ole	--	Data Recovery: Work at Site 50-50-10-2636, a cultural deposit. A radiocarbon date of A.D. 1295-1495 was returned.

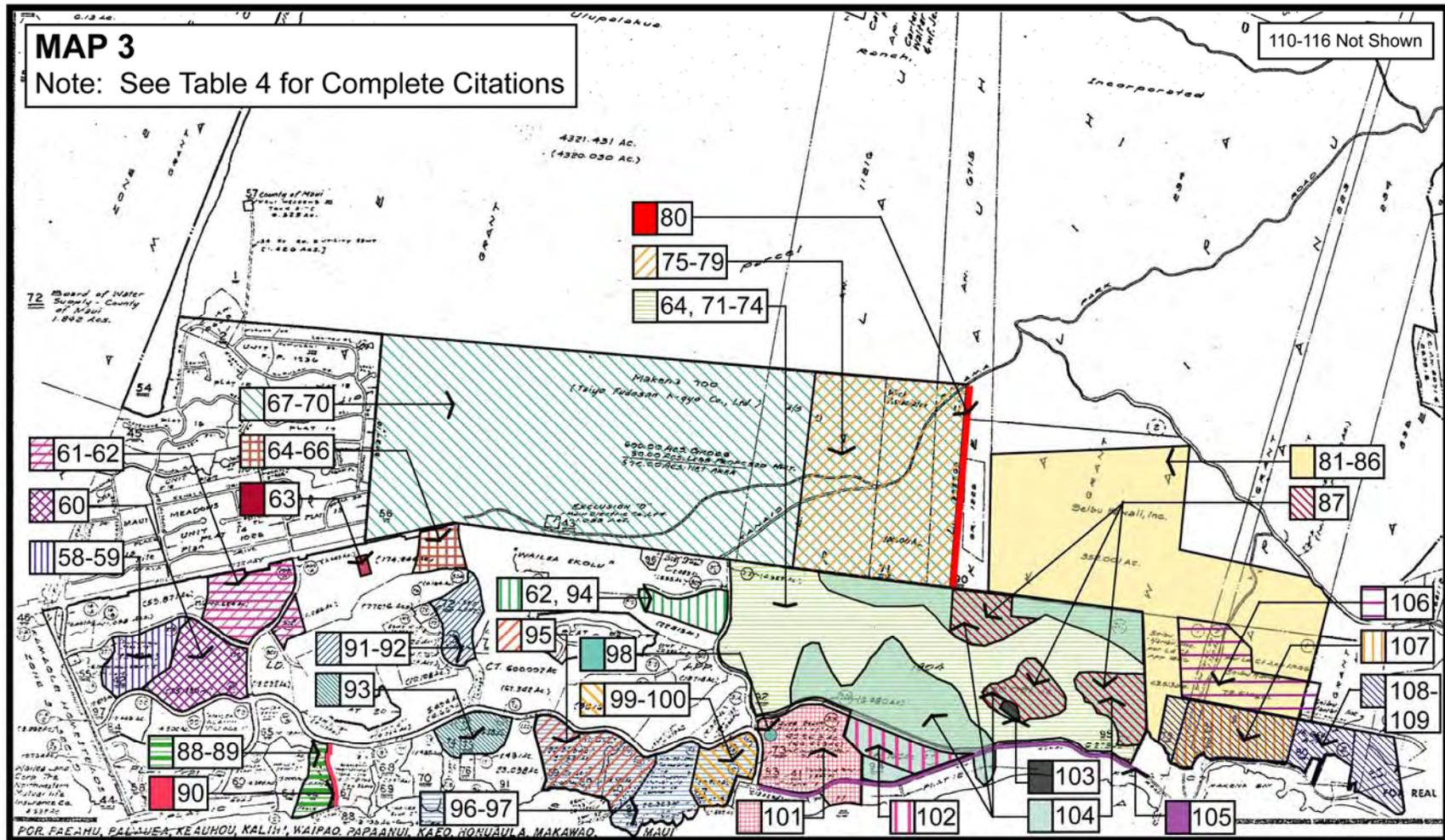


Table 4 Previous Archaeological Studies Depicted on MAP 3 (Figure 9)

Study #	Author	Year	Ahupua'a	TMK	Results
58	Pantaleo & Sinoto	1991b	Paeahu	2-1-08: 115	Assessment: of the Wailea One Parcel (23.95 acres): One wall was recorded, but was not given a site number.
59	Sinoto et al.	1999b	Paeahu	2-1-08: 115	Inventory Survey of the Wailea One Parcel (23.195 acres): The wall (50-50-14-4791) was assigned a site number.
60	Rosendahl, P.	1981a, b, c	Paeahu	2-1-08: 42 por.	Reconnaissance Survey: in the area between Okolani and Kapili Streets.
61	Klieger et al.	1992	Paeahu	2-1-08: 42 por.	Data Recovery Wailea Resort Parcel SF-7 (13.27 ac.): Two sites (50-50-14-2867-2868) tested (3 C-shapes and 3 modified outcrops) at 240 ft amsl. Only basalt and volcanic glass flakes and some polishing stones were recovered. The C-shapes were interpreted as WWII structures. Only modern dates were returned.
62	Landrum & Cleghorn	1989	Palauea, Paeahu	2-1-08: 42 por.	Reconnaissance Survey of Parcels SF-7 and SF-10: 7 sites with 11 surface features were recorded. 14 subsurface features were exposed in backhoe trenches. Two radiocarbon dates of A.D. 1680-1860 and 1520-1620 were determined.
63	Stocker et al.	1992	Paeahu	2-1-08: 42 por.	Inventory Survey of Parcel MF-12: One site (50-50-14-3114) with four features was recorded. Test pits and backhoe excavations were conducted. No subsurface features were found.
64	Gosser et al.	1993	Palauea, Waipao	2-1-08: 42 por.	Data Recovery: in the Southern Acreage and Lot 15.
65	Gosser et al.	1995	Paeahu	2-1-08: 42 por.	Inventory Survey: Parcel MF-11.
66	Roe & Cleghorn	1990	Paeahu	2-1-08: 42 por.	Reconnaissance Survey of a 10.41 acre parcel (MF-11). Two rock shelters were recorded Site 2703, and 14,2702.
67	Sinoto & Pantaleo	2001	Paeahu, Palauea, Keauhou	2-1-08: 56, 71	Inventory Survey of 670 acres of the Wailea 670 Parcel: Resurvey of densely vegetated areas; four previously unrecorded sites (50-50-14-5109-5112) were found, one in the north section and three in the south section; little cultural material was found during testing.

Study #	Author	Year	Ahupua'a	TMK	Results
68	Walton	1972	Palauea, Papaanui, Keauhou	2-1-08: 56, 71	Reconnaissance Survey of the Pi'ilani Hwy extension through the Wailea 670 Project Area: Recorded seven sites (201-205, 211) in 670 project area including walls and structural complexes; road corridor 3.2 to 4.8 m inland in barren zone. In all, recorded 12 sites (201-212) with 19 features.
69	Kennedy	1988	Paeahu, Palauea, Keauhou	2-1-08: 56, 71	Reconnaissance Survey of the Pi'ilani Hwy extension through the Wailea 670 Parcel: The seven sites first recorded by Walton were not relocated.
70	Hammatt	1979	Paeahu, Palauea	2-1-08: 56- 71	Reconnaissance Survey of the Wailea 670 Parcel (700 Acres) in the coastal and lower barren zone. The seven sites first recorded by Walton were not relocated.
71	Barrera	1974	Palauea, Paeahu	2-1-08: 92	Reconnaissance Survey of the Wailea Land Co. Southern Acreage: Several Coastal and Lower Barren zone parcels; identified 16 sites with 29 features (50-50-14-2697, 2698, B10-2, B10-4 to 15).
72	Cleghorn	1974	Palauea	2-1-08: 92	Inventory Survey of Wailea Land Co. Southern Acreage: Recorded 13 sites with 88 features in the T-16 area (later consolidated into State sites 50-50-14-2696-2700, 2688).
73	Kirch	1970	Palauea, Keauhou	2-1-08: 92	Data Recovery at the Wailea Land Co. Southern Acreage: Excavation of two pre-contact site complexes. Site 1028 was determined to be a <i>kauhale</i> complex and 1029 a possible <i>mua</i> , or men's house.
74	Kirch	1971	Palauea	2-1-08: 92	Data Recovery at the Wailea Land Co. Southern Acreage: published report of the 1970 excavation at sites 1028 to 1029. One habitation feature dated to A.D. 1545-1745 at Palauea Landing Site 50-50-14-1028.

Study #	Author	Year	Ahupua'a	TMK	Results
75	Toenjes et al.	1992	Palauea	2-1-08: 71	Inventory Survey of the Murray Pacific Project (57 acres): Conducted intensive recording and testing at 20 (232-235, 237-238, 240, 260-261, 1027-1030, 2860-2866) previously recorded sites. Four sites were dated - Site 235, two C-shapes, returned a modern date; Site 2680, an historic midden returned a post-contact date; Site 2862, a midden, returned a pre-contact date; and Site 260, a habitation/ possible <i>heiau</i> returned two dates indicating a long occupation, possibly as early as A.D. 1161; Site 235 (modern); Site 260 (A.D. 1522-1955; A.D. 1161-1625); Site 2860 (A.D. 1669-1946; Site 2862 (A.D. 1453-1955).
76	Sinoto & Pantaleo	2000	Palauea, Keauhou	2-1-08: 56 por.	Inventory Survey of the southern portion of the Wailea 670 Parcel (190 acres): 24 sites (200, 200a, 201, 204, 205, 3156-3158, 4945-4961) with 40 features were found in this rough 'a'ā land. The majority of sites were temporary habitation features associated with <i>mauka-makai</i> trails; little cultural material was found in the test units.
77	Toenjes et al.	2000	Palauea	2-1-08: 71	Inventory Survey: Supplementary Work at the Murray Pacific Project. 16 sites (232, 233, 235, 238, 240, 260-261-1072-1029, 2860-2866, 4792) with 255 features were recorded. The age of the sites dated to A.D. 1300s to A.D. 1878.
78	Haun	1987b	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Assessment of a Murray Pacific Parcel (60 acres): located 9 previously unrecorded sites.
79	Shapiro & Haun	1989	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Reconnaissance Survey: Murray Pacific Parcel - Relocated 11 previously identified sites (State sites 232-235, 238, 240, 260-261, 1027-1029) and recorded 8 new sites (no state site numbers assigned). Augering of the sand dunes produced no results.
80	Sinoto & Pantaleo	1993	Keauhou	2-1-08: 71	Inventory Survey of the Wailea 670 Parcel Southern Boundary: A C-shape and two walls (50-50-14-3156 and 3157) were recorded. The C-shape was tested but there were no cultural remains. The features were identified as possible temporary habitation or agricultural features.

Study #	Author	Year	Ahupua'a	TMK	Results
81	Gosser et al.	1997	Keauhou, Kalihi, Waipao, Papaanui	2-1-08: 92 por.	Data Recovery in Parcels III and IV of the Seibu Lands.
82	Bordner & Cox	1982	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of Seibu Lands Parcels III and IV: Recorded site complexes in Parcel IV with habitation structure and associated agricultural features on ridges with good visibility and near seasonal water.
83	Clark	1974	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Project Parcels III and IV: 8 sites were recorded in Parcel IV, including caves, enclosures, and agricultural terraces (Sites 50-50-14-2243-2250).
84	Clark et al.	1997	Keauhou, Kalihi, Waipao, Papaanui	2-1-08: 92 por.	Data Recovery in Parcels III and IV: 70 sites comprised of 493 features were recorded. 68 radiocarbon dates were determined: the earliest occupation was A.D. 1100 (1 date); 4 dates ranged from 1300 to 1500; 14 dates ranged from A.D. 1450-1700; and, 36 dates ranged from 1700 to present. Sites 50-50-14-2601 and 2602 were in Keauhou; Sites 2592 and 2597 were in Waipao/Papa'anui; 2595, 2587, and Site 2598 was in Papa'anui.
85	Pantaleo & Charvet-Pond	1989	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Lands Parcel III and IV: 75 sites with 301 features (IV 31 sites with 109 features) were recorded. 19 possible burial features were tested and human remains were found in two. Five charcoal samples from five sites ranged from A.D. 1689-1749 to A.D. 1859-1919.
86	Schilt	1988	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Lands Parcels III and IV: 221 sites with 415 features (108 sites with 172 features in Parcel IV).
87	Dang et al.	1993	Keauhou, Kalihi	2-1-08: 92	Monitoring Report on Wailea Resort Parcels MF-23, MF-22, SF-12, SF-13, and MF-20: Midden was noted in the vicinity of Site 50-50-14-2693, a probable <i>kauhale</i> .

Study #	Author	Year	Ahupua'a	TMK	Results
88	Hammatt & Folk	1979	Paeahu	2-1-08: 62	Assessment: No surface features were noted. Much of the area had been bulldozed.
89	Walker, A., & Haun	1987	Paeahu	2-1-08: 62	Reconnaissance Survey of the Grand Champions Resort (10.6 acres): One exposed cultural deposit (1794) was recorded and tested with augers. The deposit was 1.0 m in depth.
90	Folk & Hammatt	1992	Paeahu	2-1-08: 62	Assessment: No surface sites were found; much of the property had been bulldozed and graded.
91	Fredericksen, E.	1998	Paeahu	2-1-08: 103	Assessment: 4 acres-no remains.
92	Spear	2000	Paeahu	2-1-08: 103, 121	Inventory Survey: Area (17.89 acre parcel at 160-300 ft elevation) was found to be extensively modified. No surface features were found.
93	Rotunno-Hazuka & Pantaleo	1994	Paeahu	2-1-08: 74-75 por.	Inventory Survey: 15.2-acre parcel; no surface features were found. The parcel had been previously graded.
94	Gosser	1990	Paeahu	2-1-08: 42 por.	Data Recovery at Parcel SF-10: Two mounds were found and tested - probably agricultural.
95	Spear	1987	Paeahu	2-1-08: 40, 59	Inventory Survey: Five habitation sites with 13 features were recorded. Auger testing was conducted in the sand dune. A burial was found in one tested platform at Site 50-50-14-2013. Detailed recording and test excavation were conducted at sites B-1-9, and newly identified sites T-1 and T-4 (50-50-14-2011-2014). B12-6 was destroyed (sites first identified by Rosendahl 86).
96	Schilt & Dobyns	1980	Paeahu	2-1-08: 40, 59, 86, 87, 89	Reconnaissance Survey: 33 structures and one petroglyph were recorded. A volcanic rind date of A.D. 1704-1740 was determined for one feature.
97	Shun & Streck	1981	Paeahu	2-1-08: 78, 87, 86, 40, 89, 59	Data Recovery and Monitoring: 50-50-14-1281 and 1384, two habitation complexes, were tested. A C14 sample for one site was A.D. 1615-1845.

Study #	Author	Year	Ahupua'a	TMK	Results
98	Bordner	1980	Palauea	2-1-08: 92 por.	Reconnaissance Survey: Excavations in Fea. 12 and 13 of Site 50-50-14-1028, two C-shapes. They were interpreted as temporary habitations, dating to A.D. 1720-1752 (volcanic rind date). This project was an extension of Davis & Bordner 1977a, b.
99	Haun	1987a	Palauea	2-1-08: 87	Assessment of Embassy Suites Hotel site: Sites 50-50-14-2017 (residential complex) and 2018 identified.
100	Dicks & Haun	1987	Palauea	2-1-08:87	Inventory Survey of the Embassy Suites Hotel Site: Testing at Site 50-50-14-2017, a residential complex and 2018, an historic ranch wall. Augering testing of the sand dune was conducted and a cultural layer was noted. A volcanic rind date of post-1600 was determined.
101	EISC	1989	Palauea	2-1-08: 93	Data Recovery: at Site 50-50-14-1028. The excavation of C-shapes indicated that the density of cultural material was found at the entrances and outside the features rather than inside.
102	Fredericksen, E., & D. Fredericksen	2000	Palauea, Keauhou	2-1-23: 01	Inventory Survey: Parcel MF-21 - Ten sites (State Sites 50-50-14-4804 to 4813) were recorded in a 23-acre parcel. They consisted of a ceremonial site (4804), 3 rock shelters, 1 coral scatter, and 5 walls.
103	Cleghorn	1975a, b	Waipao	2-1-08: 92 por.	Data Recovery: Site 50-Ma-B10-1 consisted of one enclosure, one mound, and three alignments. 16 sq m of the site was excavated. Two volcanic rind dates were 1807-1871 and 1669-1735, indicated the site was occupied in the late pre-contact/early historic period.
104	Gosser & Cleghorn	1990	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92	Reconnaissance Survey of the Wailea Land Co. Southern Acreage.

Study #	Author	Year	Ahupua'a	TMK	Results
105	Davis & Bordner	1977b	Palauea, Papaanui, Keauhou, Waipao	--	Reconnaissance Survey of Road Corridor in Coastal Zone: Together with the above, they recorded nine sites in Palauea and 6 sites in Papa'anui. The sites formed a coastal settlement in association with a possible <i>heiau</i> (Palauea sites 232, 233, 235, 238, 240, 261, 260, and 261, 1028, 1029) [Map has sites 240, 260, 261, 1038 and 1030 in Palauea; 262, 1361-1362, B10-19 in Keauhou; 245 and B10-3 in Kalihi; B10-1 in and 197 in Waipao; none in Papa'anui; 196 and 1266 in Ke'eo].
106	Sinoto	1981	Papa'anui and Waipao	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Project area: 14 sites were recorded. Five were scattered surface middens, representing the remnants of sites that had been bulldozed.
107	Bath	1983	Palauea	2-1-08: 78	Reconnaissance Survey: Eleven sites recorded; four were cattle walls and the rest were pre-contact.
108	Rosendahl, M.	1981a, b	Paeahu	2-1-08: 42 por.	Reconnaissance Survey: in the Grand Wailea Resort- Development Sites 37, 50, 51, 74.
109	Rosendahl, M.	1987	Paeahu	2-1-08: 59	Data Recovery at the Grand Wailea Hotel: Site 50-50-14-2012 (single enclosure) and 2013 (6 habitations features) were tested. Traditional and historic artifacts were recovered. Two burials were found at site 2013. Radiocarbon dates ranged from A.D. 1640-1890; 1650-1950, WWII (Site 2012) to the mid 1300s-mid-1600s (Site 2013).
110	Davis & Bordner	1977a	Palauea	--	Reconnaissance Survey of Road Corridor in Coastal Lower Barren Zone: Seven new sites (50-50-14-232, 288, 235, 238, 240, 260 and 261) were recorded, which were part of a coastal settlement.
111	Major et al.	1995	Palauea	2-1-08: 92	Data Recovery: at Site 50-50-14-1028.
112	Rogers-Jourdane	1979a	Keauhou, Kalihi, Waipao, Papa'anui	2-1-05 thru 08	Reconnaissance Survey of the Wailea Pacific Parcel <i>mauka</i> of the highway. Sites 50-50-14-2252-2258, 2260, 2262-2270, and 2272 were recorded.
113	Rosendahl, P.	1984	Paeahu	2-1-08: 86	Assessment: Sites 4, 10, 12-13, and 14 were relocated (Rogers-Jourdane 1979b). Traditional and historic artifacts were found. Site 12/13 was a temporary habitation structure with little cultural material.

Study #	Author	Year	Ahupua'a	TMK	Results
114	Rosendahl, P., & Walker	1984	Paeahu	2-1-08: 86	Inventory Survey: Test Excavations at the Wailea Point Condominium area.
115	Walker, A. et al.	1985	Paeahu	2-1-08: 86	Inventory Survey of Wailea Point Condominiums: Backhoe trenching was conducted in a sand dune. There was no cultural deposit.
116	Rogers-Jourdane	1979b	Paeahu	2-1-08: 92 por.	Reconnaissance Survey: Seven features were recorded, including a C and a U-shaped enclosure. Site 50-50-14-1281, the Wailea Complex, was also relocated.

mauka-makai transits between coastal and inland settlements (Kirch 1970; Sinoto and Pantaleo 2000). Excavations yielded radiocarbon dates ranging from A.D. 1545-1745 (Kirch 1971).

Archaeological studies in Kalihi, Waipao, and Papa‘anui Ahupua‘a also indicated a relatively high density of sites. Investigations of Seibu Lands Parcels III and IV located 221 sites comprised of 415 features (Clark 1974; Bordner and Cox 1982; Schilt 1988; Pantaleo and Charvet-Pond 1989). Sites in higher elevations consisted of small shelter caves and agricultural features. In the lower elevations, habitation, agricultural and burial sites were located. Excavations within the Seibu Lands yielded an early occupation date of A.D. 1100 with additional dates spanning into the historic period (Pantaleo and Charvet-Pond 1989; Clark et al 1997).

4. Coastal Paeahu to Keauhou

Archaeological studies in the coastal Paeahu to Keauhou area have been focused on the Makena Beach Lots area (Figure 10, Table 5). Human burials and other cultural deposits were located in sandy sediments (Donham 1990a; Rotunno-Hazuka and Cleghorn 1990; Sinoto et al 2002; Haun and Henry 2002). Excavations also yielded radiocarbon dates ranging from A.D. 1490 to A.D. 1880 (Rotunno-Hazuka and Cleghorn 1990).

5. Coastal Kalihi to Papa‘anui

Much of the coastline from Kalihi to Papa‘anui has been covered in various archeological surveys (Figure 11, Table 6). Archaeological sites identified include human burials, habitation sites, rock shelters, canoe shed, and agricultural features (Sinoto 1978a; Clark 1988; E. Fredericksen and D. Fredericksen 1998b; Tome and Dega 2001; Lee-Greig 2002). Excavations by Cordero and Dega (2001) yielded radiocarbon dates ranging from A.D. 1280-1460.

B. Settlement Pattern

Based on available archaeological evidence and theorizing, the following settlement pattern reconstruction is posited. Based on the Clark et al. (1997) results, habitation in the coastal areas may date to as early as A.D. 1100. Much evidence exists that coastal habitation, along with more populous inland/upland settlement was well established by A. D. 1400-1500. The majority of permanent habitation would have been in the uplands, concentrated in the fertile agricultural areas. Coastal permanent habitations were likely less numerous and centered around ceremonial structures and fishponds. Temporary habitations related to marine exploitation, such as stacked-stone enclosures, and possibly smaller ceremonial structures, such as stacked-stone fishing shrines, may also have been scattered along the coastline. Burials would have been interred in the coastal sand dunes, where present, immediately back from the coast. *Mauka-makai* trails would have connected the coastal settlement with the *mauka* permanent habitation. Temporary habitations and rock shelters would have been utilized as stopping points between the coastal and upland settlements. Coastal or *alanui* trails would have connected different coastal habitation areas. The barren or intermediate zone, between the coast and the uplands is broad in this portion of Maui. Inventory surveys of portions of the intermediate zone of Waiohuli Ahupua‘a have found remnants of dispersed, low-intensity, dry-land agricultural features, such as mounds and alignments, as well as temporary habitations.

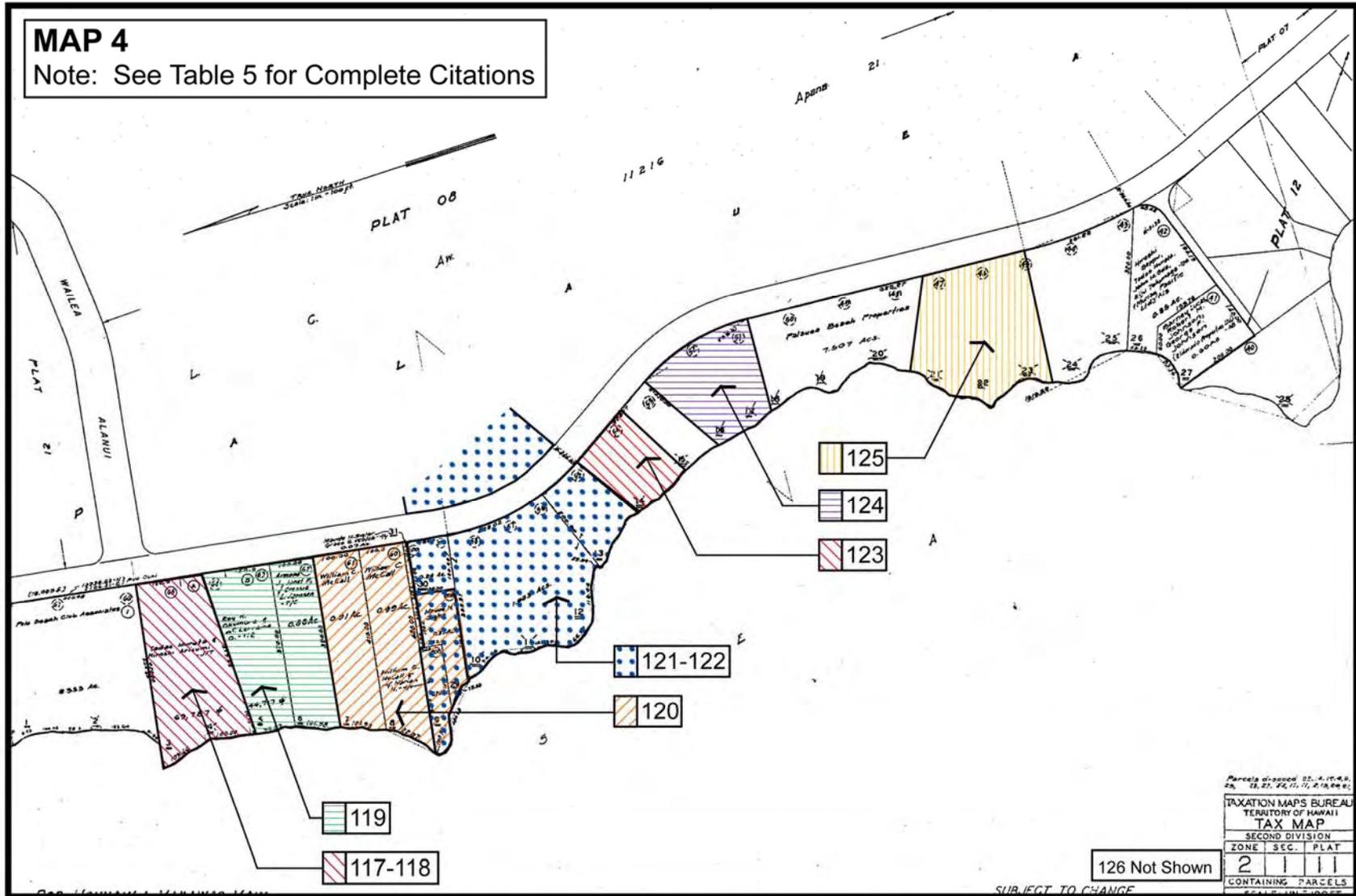


Figure 10 MAP 4 Coastal Paeahu to Keauhou (Tax Map Key 2-1-11, 12), Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Corridor.

Table 5 Previous Archaeological Studies Depicted on MAP 4 (Figure 10)

Study #.	Author	Year	Ahupua'a	TMK	Results
117	Henry et al.	1992	Palauea	2-1-11: 03	Data Recovery: Additional testing (augers and backhoe trenches) at the Makena Beach lots (1.6 acres) where Donham (1990b) found two infant burials (Site50-50-14- 2496). Subsurface cultural deposits were found, but no additional burials were uncovered.
118	Donham	1990b	Palauea	2-1-11: 03	Inventory Survey of the Makena Beach Lots (1.6 acres): One site complex (50-50-14-2496) with six features was recorded. Two infant burials were found. Three radiocarbon dates were determined: A.D. 680-1020; 1440-1670; and, 1280-1470. All three dates were from the same pit.
119	Rotunno-Hazuka & Cleghorn	1990	Palauea	2-1-11: 05, 06	Inventory Survey: Supplement report to Landrum and Cleghorn 1989 - Hand excavated trenches in parcels 5 and 6. Pre-contact and historic deposits were uncovered, dating to A. D. 1490-1590 and A.D. 1780-1880 (C14 dating).
120	Cleghorn & Landrum	1989	Palauea	2-1-11: 07, 08, 09, 29, 31	Phase I Survey.
121	Haun	1987b	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Assessment of the Murray Pacific Parcel (60 acres): Same project area as Kirch 1969; located 9 previously unrecorded sites.
122	Shapiro & Haun	1989	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Reconnaissance Survey: Relocated 11 previously identified sites (State sites 232-235, 238, 240, 260-261, 1027-1029) and recorded 8 new sites (no state site numbers assigned). Augering of the sand dunes produced no results.
123	Sinoto et al.	2002	Palauea	2-1-11: 14	Inventory Survey: Nine backhoe trenches were excavated in this 0.52-acre coastal parcel. A cultural deposit (designated State Site 50-50-14-5194) with two hearth features was recorded.
124	Haun & Henry	2002	Palauea	2-1-11: 16-17	Inventory Survey: No surface features were noted. 21 backhoe trenches were excavated. A cultural deposit with two human burials, designated State Site 50-50-14-5200, was found during subsurface testing.

Study #.	Author	Year	Ahupua‘a	TMK	Results
125	Haun & Henry	2001b	Palauea	2-1-11: 21, 22, and 23	Inventory Survey: Two sites were recorded. Site 50-50-14-5104 (stratified cultural deposit) was dated to A.D. 1660-1950 and Site 5120 is an historic road, probably dating to WWII.
126	Kirch	1969	Paeahu, Palauea, Keauhou, Papaanui	--	Reconnaissance Survey of the Wailea Resort: Documents a coastal settlement and settlement patterns. Recorded 11 sites, which were later consolidated into 8 State Sites (50-50-14-197, 1027, 1281, 1351-1353, 1362, and 1358). Site 1362 is a possible <i>heiau</i> .

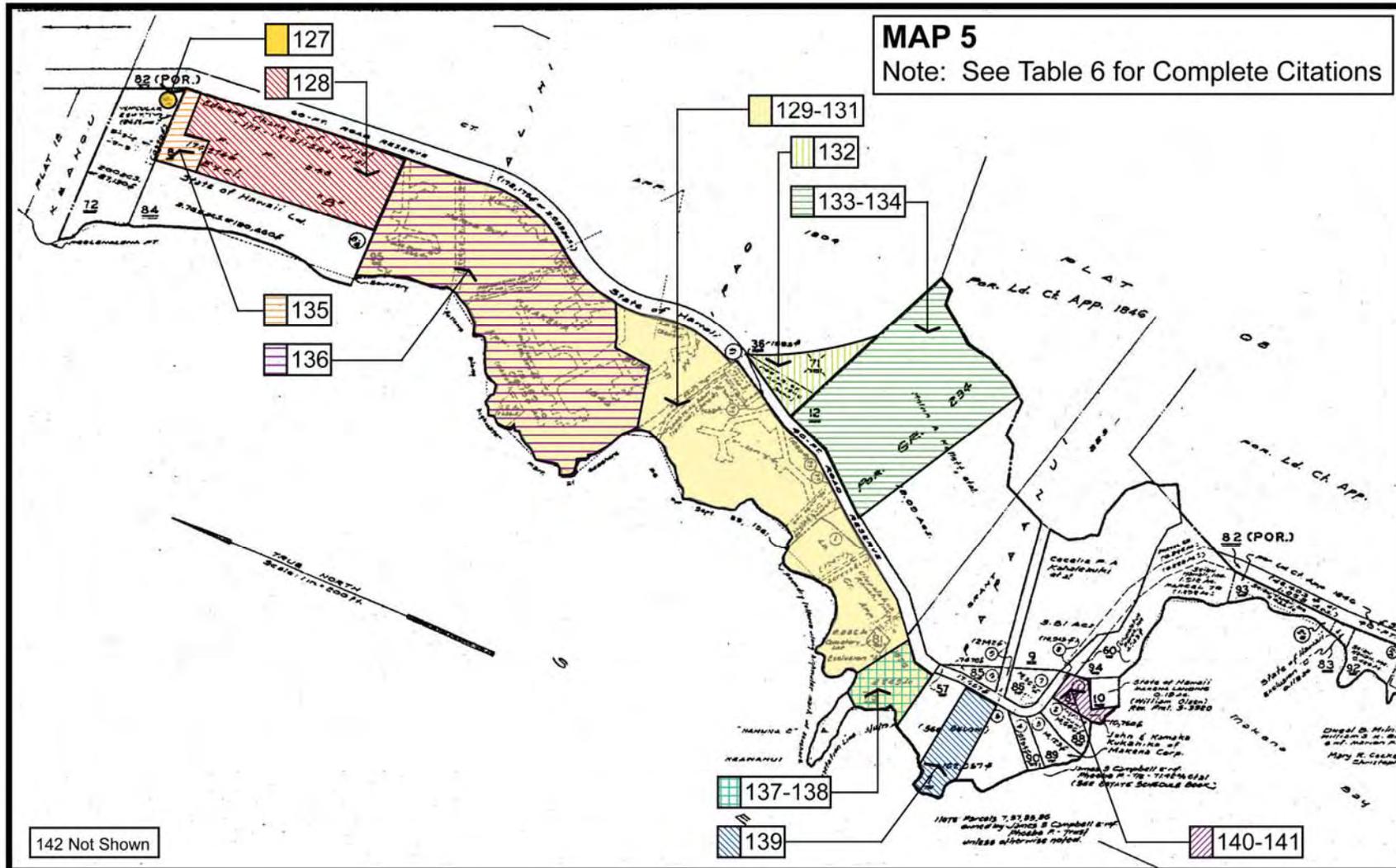


Figure 11 MAP 5 Coastal Kalihi to Papa'anui (TMK 2-1-07), Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Corridor.

Table 6 Previous Archaeological Studies Depicted on Map 5 (Figure 11)

Study #	Author	Year	Ahupua'a	TMK	Results
127	Dega	2000	Kalihi	2-1-07: 72	Inventory Survey: Five features were recorded and two were tested; one wall, one terrace and 3 rock mounds (later determined to be bulldozer push piles). The first two features were incorporated into the previous identified 50-50-14-4818, a pre-contact habitation site first identified by Roberts et al. 2000.
128	Lee-Grieg	2002	Keauhou, Kalihi	2-1-07: 08, Lot A-1	Inventory Survey: 3.19-acre parcel; two walls (Site 50-50-14-4818) and one fence line were identified. Three backhoe trenches, eight shovel tests, and seven test units were excavated. One cultural deposit was identified and one burial was encountered.
132	Fredericksen, E., & D. Fredericksen	1998d	Papa'anui (Waipao)	2-1-07: 71	Inventory Survey: Three previously unrecorded sites were located (50-50-14-4504, 4505, and 4506), a post-contact enclosure, a rock overhang, and a pre-contact habitation. Site 4505 enclosure was possibly one of the seven school houses built in the early 19th century.
133	Cordero & Dega	2001	Papa'anui (Waipao)	2-1-07: 12, Lot B	Data Recovery: 6-acre parcel: Six sites located (50-50-14-3513 to 3518) with 25 features. Three radiocarbon dates were determined: A.D. 1680-1940, 1630-1910; 1280-1460. Site 3513 was a permanent habitation site. Testing was also conducted at Sites 3513, 3514, and 3516.
134	Chaffee & Spear	1994	Papa'anui (Waipao)	2-1-07: 12, Lot B	Inventory Survey: Six sites (50-14-3513 to 3518) with 25 features were recorded in a 6-acre parcel. Wood charcoal from a modified outcrop was dated to A.D. 1660-1950.
135	Roberts et al.	2000	Kalihi	2-1-07: 102, 8 por.	Inventory Survey: One site, 50-50-14-4818, was identified. It was a temporary habitation in the proto-historic period with an historic wall component. Two C14 dates were determined; one modern and one AD 1800-1940.
136	Clark	1988	Papa'anui	2-1-07: 95	Data Recovery: Report on additional burials found at this site.50-50-14-1830.

Study #	Author	Year	Ahupua'a	TMK	Results
129	Sinoto & Rogers-Jourdane	1979	Keauhou, Kalihi, Waipao, Papaanui	2-1-07: 36, 79, 81	Reconnaissance Survey of Makena Surf Parcel (17 acres): Test Excavations at 13 sites (no state site numbers) previously recorded by Sinoto (1978a). Volcanic rind dating was used to determine that two sites dated to the pre-contact period and all other sites were within the early historic period from A.D. 1750-1800.
130	Sinoto	1978a	Keauhou, Papaanui, Kalihi, Waipao	2-1-07: 36, 79, 81	Reconnaissance Survey on the Makena [Surf] Shores Parcel (17 acres): Eighteen features were recorded but were not given State site numbers. They included coastal habitation features, including a canoe shed, and an historic cemetery.
131	Dobyns	1988	Papa'anui, Kalihi, Waipao, Keauhou	2-1-07: 36, 79, 81	Data Recovery on the Makena Surf Parcel (17 acres): Test Excavations at seven sites (no state site numbers); Volcanic rind analysis produced dates that ranged from A.D. 1601-1812. Recovered artifacts also suggested later pre-contact and/or early historic occupation for most of the sites.
137	Fredericksen, E., & D. Fredericksen	1998b	Papa'anui	2-1-07: 79, Lot 1-A	Inventory Survey: One previously unrecorded site, 50-50-14-4544, consisted of a habitation and activity area, a rock shelter, and a pavement of waterworn pebbles and coral refuse pit. The shelter had artifacts, tattoo needles, tools, and midden. Ornaments, shark teeth, and volcanic glass flakes were found on the pavement.
138	Jourdane	1988	Papa'anui	2-1-07: 79	Monitoring Report: at Sites 50-50-14-1817 to 1819. A backhoe trench was excavated. No cultural deposit was found. Eight bait cups were found on the coastal point west of these sites and north of Nahuna point.
139	Fredericksen, E., & D. Fredericksen	1998c	Papa'anui	2-1-07: 07, 98	Inventory Survey: 4 sites found (50-50-14-4524-4527) were recorded. Site 4524 is possibly the Nanahu Ko'a, first recorded by Walker 1931. Other sites were an overhang and historic walls.
140	Tome & Dega	2001	Papa'anui (Waipao)	2-1-07: 87	Inventory Survey: One Site (50-50-14-5123) was identified, consisting or an alignment and a rock-filled terrace. The site was interpreted as a pre-contact/early historic temporary habitation.

Study #	Author	Year	Ahupua'a	TMK	Results
141	Tome & Dega	2002b	Papa'anui (Waipao)	2-1-07: 87	Monitoring Report at site 50-50-14-5123, which had been previously tested and found to contain pre-contact lithics, charcoal and shell midden. During monitoring, an historical deposit with many historic artifacts was also uncovered. The majority of the artifacts dated to the 1940s, when the military occupied the area.
142	Fredericksen, E., & D. Fredericksen	1998a	Papa'anui	2-1-07: 99	Inventory Survey: 4 sites recorded and tested: a WWII concrete base for a cannon (50-50-14-4673), an overhang shelter (4674), a site remnant (4675), and a rock shelter (4676).

C. Predictive Model

The main waterline project corridor, which generally parallels the existing Kula Pipeline, is located within the fertile upland agricultural zone. This area would have been heavily utilized in pre-contact times for permanent habitation and agriculture. Traditional sweet potato cultivation would have been replaced in historic times by Irish potato cultivation. Later land use would have been dominated by ranching activities into the present. Within the main waterline corridor, it is predicted that traditional archaeological sites may include agricultural terraces, stone clearing mounds, and possibly habitation platforms or terraces. However, traditional sites may be limited due to the continued utilization and reworking of the land over time. Historic archaeological sites may include stone walls, historic agricultural terraces, or ranch related infrastructure. Within the *makai* running lateral line corridors, land use may shift with decreasing elevation from fertile upland agricultural zone toward the intermediate or barren zone. It is predicted that traditional archaeological sites may include agricultural terraces and temporary habitation sites.

IV. FIELD INSPECTION RESULTS

A complete pedestrian inspection of the project corridor was completed on October 20-21, 2003 by three CSH archaeologists, David Shideler, M.A., Tanya Lee-Greig, M.A., and Todd Tulchin, B.S., under the overall supervision of Hallett H. Hammatt, Ph.D. The pedestrian inspection of the 'Ulupalakua Water System Replacement project corridor was completed at 100% coverage.

Very low vegetation in the majority of the project area, due to active cattle grazing or 'a'ā lava flows, made for excellent visibility. Pedestrian inspection of the project corridor noted extensive land modification likely associated with prehistoric through modern era agricultural activities in the area. The majority of the active pasture land exhibited a lack of surface stones as well as the presence of scattered clearing mounds. Cleared dirt roads and barbed wire fences were found throughout the project area, associated with the current usage of the land as pasture. Specific descriptions of the findings in each of the project corridor sections follows:

A. Kama'ole Section (including Area of Possible Future Improvements)

The Possible Future Improvements Section of the project corridor extended from the water tank *mauka* of the Kula Hospital (Sanatorium) south to the Kama'ole water tank (Figure 12). The Kama'ole Section of the project corridor extended from the Kama'ole water tank to the Kama'ole / Paeahu *ahupua'a* boundary. The land in this portion of the project corridor is owned by the Haleakalā Ranch and is active cattle pasture. The Kama'ole Section exhibited less land modification than the lands to the south owned by the 'Ulupalakua Ranch, evidenced by the relative abundance of surface stones and bedrock outcrops. Numerous stone clearing mounds, understood as traditional Hawaiian agricultural features, were observed throughout this portion of the project corridor. Two types of agricultural terracing (CSH 1) were observed within this section of the project corridor.

1. Site: CSH 1

Site Type: Terraces

Function: Agricultural

Features: Many

(Figures 13-18)

CSH 1 is a complex of multiple agricultural terraces located in the northernmost portion of the project corridor, near the Kula Hospital, generally between stations 6 and 15 along the main waterline (see Figure 12). Figures 13 through 15 show examples of the types of terracing observed along the slopes in the vicinity of the project corridor. These terraces were generally constructed with linear stacked 'a'ā boulder and cobble retaining walls bordering one to three sides, creating multiple level planting areas. The faced retaining walls contained 20 to 30 cm (centimeter) diameter stones stacked two to three courses with a maximum height of 65 cm.

Figures 16 through 18 show a second type of terracing observed near station 14 along the main waterline. This agricultural terrace was situated in a small drainage gully, bordered on either side by bedrock outcrops. The *mauka/makai* running bedrock outcrops were modified with

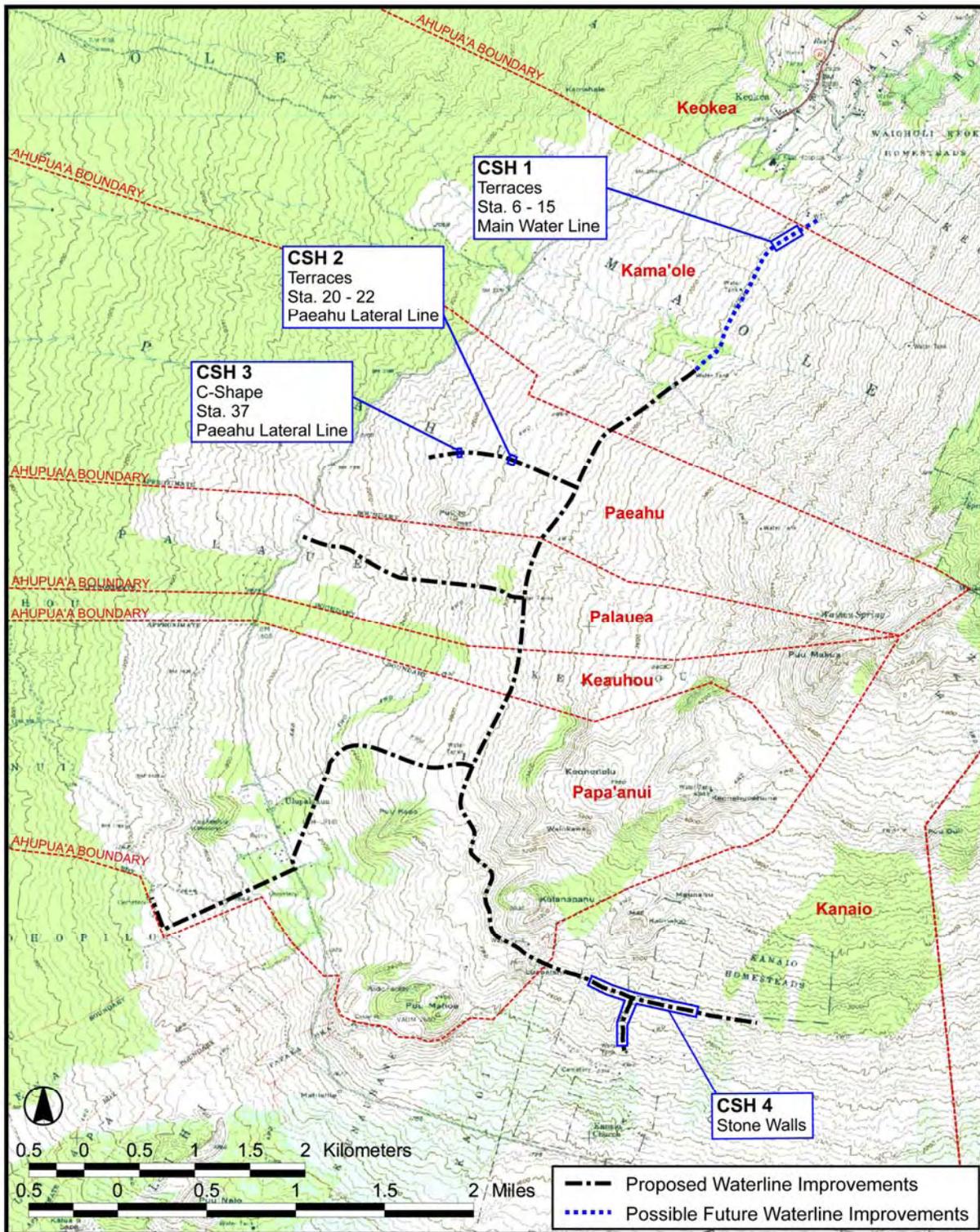


Figure 12 USGS Topographic Map, Makena Quad., Showing the Location of Archaeological Sites in the Vicinity of the Project Corridor.

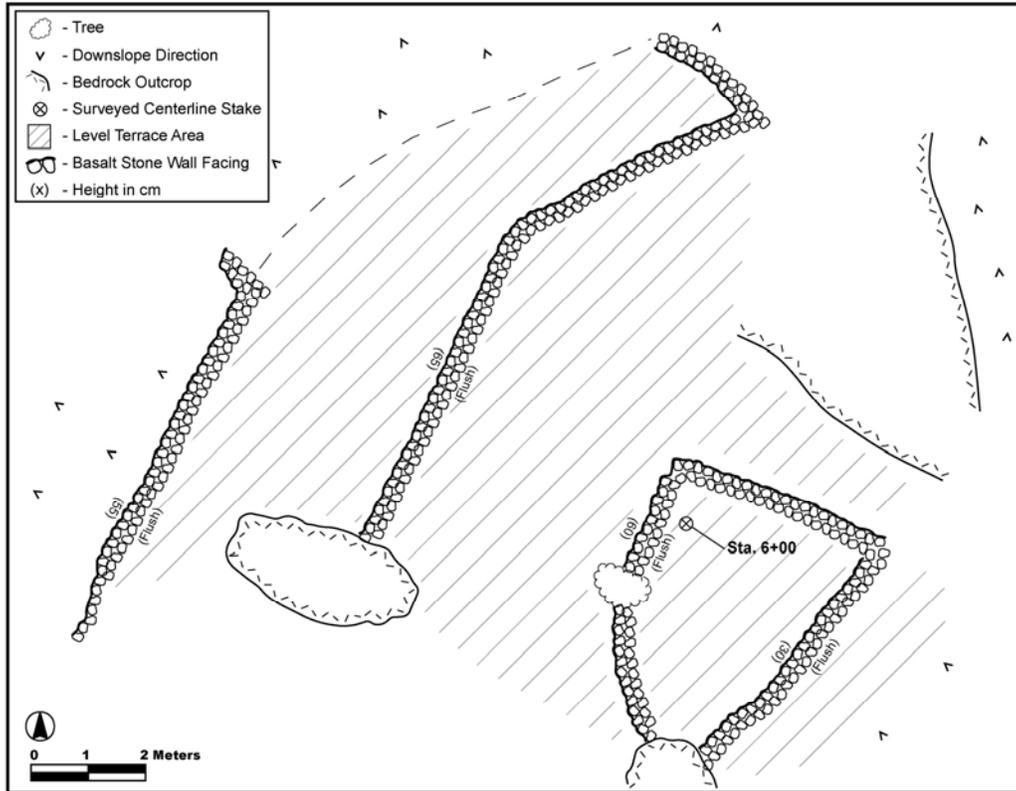


Figure 13 Plan View of CSH 1 – Terraces - Station 6, Main Waterline.



Figure 14 Site CSH 1 – Terraces - Station 6, Main Waterline, View to SE.



Figure 15 **Site CSH 1 – Terraces - Station 14, Main Waterline, View to Southeast.**

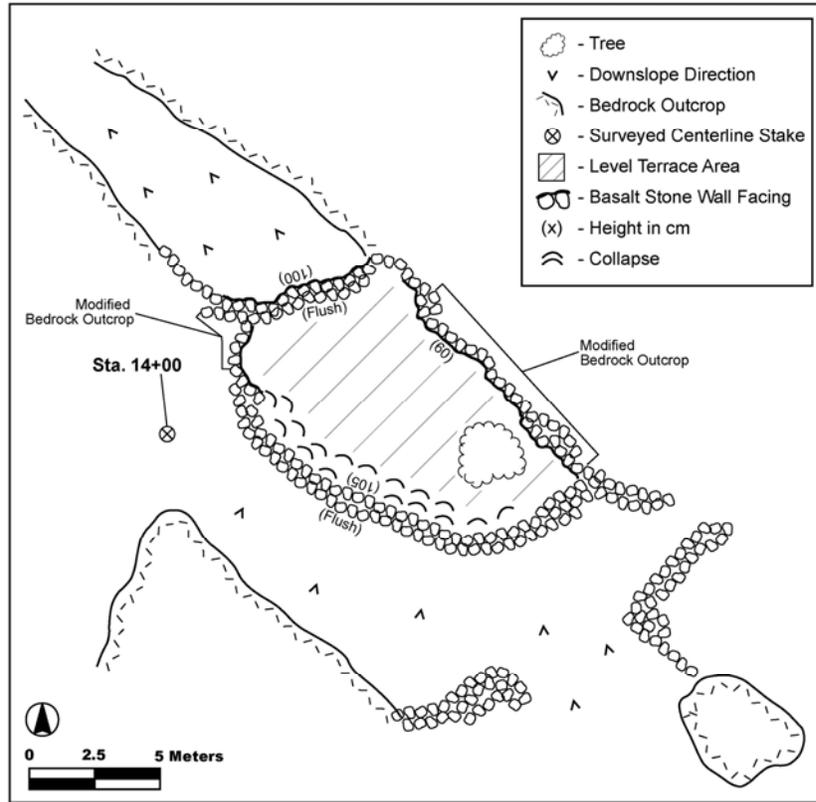


Figure 16 Plan View of CSH 1 - Modified Outcrop / Terrace - Station 14, Main Waterline



Figure 17 Site CSH 1 - Modified Outcrop / Terrace - Station 14, Main Waterline, View to South.



Figure 18 **Site CSH 1 - Modified Outcrop / Terrace Retaining Wall - Station 14, Main Waterline, View to Southeast.**

the addition of ‘*a’ā* boulders and cobbles stacked two to three courses high with a maximum height of 60 cm above the bedrock surface. A retaining wall of basalt boulders stacked five courses high was constructed across the gully, creating a level terrace within. The retaining wall measured 3.6 m in length with a maximum height of 100 cm. The south and southwest portions of the drainage gully area bordered by a semi-collapsed retaining wall consisting of basalt boulders and cobbles with a maximum height of 105 cm. The level terrace area measured approximately 5.5 m by 7.3 m. Additional modified outcrop / terraces were observed within the same drainage gully both *mauka* and *makai* of the project corridor. The terraces within Site CSH 1 are believed to be of both pre-contact and historic origin and are evaluated under Criterion D (may be likely to yield information important to prehistory or history) of the State and National Registers of Historic Places..

B. Paeahu through Keauhou Section

The Paeahu through Keauhou section of the project corridor included the main waterline running through Paeahu, Palauea and Keauhou Ahupua‘a, as well as the Paeahu and Palauea lateral lines extending *makai* from the main waterline (see Figure 12). The land in this portion of the project corridor is active cattle pasture and is owned by the ‘Ulupalakua Ranch. Increasing land modification was observed throughout this section of the project corridor, evidenced by the decreasing amount of surface stones heading south along the project corridor. An area of agricultural terracing (CSH 2) was located along the Paeahu lateral line near station 21. Also located along the Paeahu lateral line near station 37 was a U-shaped structure (CSH 3).

1. Site: CSH 2

Site Type: Terraces

Function: Agricultural

Features: 4

(Figure 19)

CSH 2 is a complex of agricultural terraces constructed along the southern edge of a shallow swale near station 21 of the Paeahu lateral line (see Figure 12). These terraces were constructed with both linear and semi-circular stacked ‘*a’ā* boulder and cobble retaining walls creating multiple level planting areas (Figure 19). The planting areas decreased in area with increasing elevation, with the *makai*-most planting area covering an area of approximately 10 m². The most *makai* of the terrace retaining walls is a single linear alignment measuring approximately 5.5 m in length with a maximum height of 50 cm. The second, most *makai* terrace retaining wall is also a single linear alignment measuring approximately 10.3 m in length, with a maximum height of 70 cm. The second most *mauka* terrace retaining wall is a semi-circular alignment measuring approximately 7.7 m in length, with a maximum height of 100 cm. The most *mauka* of the terrace is bordered on three sides by a retaining wall. The *makai* wall measured approximately 6.0 m with a maximum height of 60 cm. The existing Paeahu lateral line was observed to run adjacent to the southern edge of Site CSH 2. The terraces within Site CSH 2 may be of both pre-contact and historic origin and are evaluated under Criterion D (may be likely to yield information important to prehistory or history) of the State and National Registers of Historic Places.



Figure 19 Site CSH 2 - Terrace Complex - near Station 21, Paeahu Lateral Line. View to Southeast.

2. **Site:** CSH 3
Site Type: U-Shaped Structure
Function: Habitation
Features: 1
(Figure 20)

CSH 3 is a U-shaped structure constructed of stacked basalt boulders and cobbles (Figure 20). It is located on top a small hill near station 37 along the Paeahu lateral line (see Figure 12). The open end of the U-shape faces in the *makai* direction. Overall condition of the structure is good. The interior walls of the structure are well-faced with a few areas of partial collapse. The exterior of the structure is sloping. The interior of the U-shape measures 3.2 m in length by 2.0 m in width. Interior wall heights reach a maximum of 130 cm. Wall thickness in intact portions of the structure is approximately 85 cm. Site CSH 3 is believed to be of pre-contact origin and is evaluated under Criterion D (may be likely to yield information important to prehistory or history) of the State and National Registers of Historic Places.

C. Papa‘anui Section

The Papa‘anui Section of the project corridor includes the portion of the main water line that passes through Papa‘anui Ahupua‘a, as well as the Papa‘anui lateral line which extends *makai* from the main waterline. This portion of the main waterline generally parallels existing jeep roads and is actively used as cattle pasture by ‘Ulupalakua Ranch. Significant land modification was evidenced by the marked lack of surface stones in the area. The Papa‘anui lateral line extends *makai* through active cattle pasture to the Kula Highway. The lateral line then parallels the highway and extends further *makai* along a paved road. The area in the vicinity and *makai* of the Kula Highway contains both developed residential as well as agricultural lots. No historic properties were observed within the Papa‘anui Section of the project corridor.

D. Kanaio Section

The Kanaio Section of the project corridor includes the portion of the main waterline that passes through Kanaio Ahupua‘a, as well as the Kanaio lateral line extending *makai* toward the Pi‘ilani Highway. The majority of the land through which the Kanaio Section of the project corridor is owned by the State of Hawai‘i. The western portion of the Kanaio Section was rough ‘*a‘ā* terrain with limited vegetation. The remaining portion of the main waterline corridor appeared to be former pasture land, though it exhibited less land modification than lands owned by the ‘Ulupalakua Ranch. There was a relative abundance of surface stones and moderate scrub vegetation including Christmas Berry. A portion of the main waterline corridor also passed through a grove of Eucalyptus trees. The eastern terminus of the project corridor was a bowl-shaped concrete reservoir. Located within the main waterline corridor were numerous ranch related stone walls and clearing mounds (see Figure 12, CSH 4).



Figure 20 Site CSH 3 - U-Shape – near Station 37, Paeahu Lateral Line. View to East.



Figure 21 Site CSH 4 – Stone Walls - One of Many in the Kanaio Area, View to North.

The *mauka* portion of the Kanaio lateral line passed between developed houselots including graded and landscaped areas. The *makai* portion of the Kanaio lateral line also appeared to be former pasture land, though it was now becoming overgrown with scrub vegetation including Christmas Berry. Numerous ranch-related stone walls were located within the Kanaio lateral line corridor (see Figure 12, CSH 4).

1. **Site:** CSH 4

Site Type: Stone Walls

Function: Ranch Related

Features: Many

(Figure 21)

CSH 4 includes numerous stone walls and clearing mounds related to ranching activities in the vicinity of the project corridor in the Kanaio area (see Figure 12). Figure 21 shows an example of a stone wall constructed along the edge of a bedrock outcrop. In general, the walls were constructed of stacked 'a'ā boulder and cobble to varying widths and heights. The walls were observed to be in fair condition with some areas of collapse. The existing Kanaio lateral line was observed to run through or over any stone walls in its direct path. In a previous archaeological study in the Kanaio area (Bruce et al. 1972 in Walker 1931), it was noted that “stone walls are everywhere” (see Previous Archaeology section for additional details). In addition to the ranch related stone walls, several formal and informal clearing mounds were located in the vicinity of the project corridor. Site CSH 4 is believed to be of historic origin and is evaluated under Criterion D (may be likely to yield information important to prehistory or history) of the State and National Registers of Historic Places.

V. SUMMARY AND RECOMMENDATIONS

The proposed 'Ulupalakua Water System Replacement Project corridor generally parallels the existing Kula Pipeline. The majority of the project corridor passes through either active or former pasture land for grazing cattle. Significant land modification was observed throughout the project corridor, evidenced by a lack of surface stones and the presence of stone clearing mounds. The areas which appeared to exhibit the most land modification were those owned by the 'Ulupalakua Ranch and actively used as pasture. Land in the Kanaio area contained the most rocky terrain, with relatively low levels of stone clearing.

Three areas of archaeological concern were noted in the field inspection of the project corridor. The first is in the northernmost portion of the project corridor, within the area which may undergo future waterline improvements. Site CSH 1 contained a complex of numerous agricultural terrace features within the project corridor, as well as both upslope and downslope. These terraces are likely a combination of pre-contact and historic agricultural activities in the area. It is recommended that if possible, the waterline be routed to avoid contact with any terraces in the area. If this is not feasible, the waterline should be designed to minimize any impacts to the archaeological features.

The second area of archaeological concern is in the central and *makai* portions of the Paeahu lateral line. Site CSH 2 contained a complex of agricultural terraces in the central portion of the Paeahu lateral line. These terraces are likely a combination of pre-contact and historic agricultural activities in the area. The existing Paeahu lateral line was observed to run along the southern edge of the shallow swale in which the terraces are located. It is recommended that any disturbance to CSH 2 be avoided by routing the new Paeahu lateral line south of the existing lateral line in the vicinity of the terrace area. Site CSH 3 is a single U-Shaped structure located in the *makai* portion of the Paeahu lateral line. The structure was located a safe distance (10-15 m) from the staked waterline corridor, though care should be taken to avoid any disturbance to CSH 3 during waterline construction.

The third area of archaeological concern is in the Kanaio portion of the main waterline corridor as well as the Kanaio lateral line. Site CSH 4 consists of many ranch related stacked stone walls in the Kanaio area. These walls are crossed by the proposed waterline corridor in several locations. However, the walls were observed to be previously breeched by the existing Kula pipeline and Kanaio lateral line. It is therefore recommended that because the walls in the waterline corridor have been previously disturbed and there are many similar stone walls in the area that will not be affected by this project, the proposed waterline replacement project be allowed to breech any ranch related stone walls in its direct path. However, care should be taken to minimize any impacts to the stone walls by either routing the line over the walls or rebuilding the walls over the constructed pipeline.

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APPENDIX E

Cultural Impact Assessment
In Support of the
‘Ulupalakua Water System Improvements
Kama‘ole, Paeahu, Palauea, Keauhou, Waipao, Papa‘anui, and Kanaio
Makawao (Kula and Honua‘ula) District, Maui

DRAFT REPORT

Portions of TMK: 2-2-01, 2-1-03, 2-1-08 and 2-1-09)

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ABSTRACT

At the request of Belt Collins Hawai'i, Cultural Surveys Hawai'i, Inc. conducted a Cultural Impact Assessment in support of the proposed 'Ulupalakua water system improvements, Makawao district, island of Maui. The following report discusses the results of the cultural impact assessment of the Kula and Honua'ula upland areas. This assessment indicates that there will be little or no impact to cultural or traditional practices from the waterline improvement project.

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I. INTRODUCTION

At the request of Belt Collins Hawai'i, Cultural Surveys Hawai'i, Inc. conducted a Cultural Impact Assessment for the proposed 'Ulupalakua Water System Improvements, Makawao District, Island of Maui (Figures 1 and 2).

The purpose of the Cultural Impact Assessment is to consider the effects that the proposed water systems improvement project may have on native Hawaiians and other groups as it pertains to their culture and right to practice traditional customs. The Hawai'i State Constitution, Article XII, Section 7 protects "all rights" of native Hawaiians that are "customarily and traditionally exercised for subsistence, cultural and religious purposes." Act 50 (SLH 2000) was passed as an attempt to balance the scale between traditional lifestyles and development and economic growth. Act 50 provides that environmental impact statements: (1) Include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amends the definition of "significant effect" to include adverse effects on cultural practices.

The Scope of Work (SOW) was designed to meet the *Guidelines For Assessing Cultural Impacts* as adopted by the Office of Environmental and Quality Control (OEQC) (1997), as well as, the requirement of any other State and County agencies involved in the review process for the proposed project. The *Guidelines...* issued by the Office of Environmental and Quality Control (OEQC) discuss the types of cultural resources, practices and beliefs that might be assessed. The Guidelines state:

The type of cultural practices and beliefs subject to assessment may include subsistence, commercial, residential, agricultural, access-related, recreational, and religious and spiritual customs. The types of cultural resources subject to assessment may include traditional cultural properties or other types of historic sites, both man-made and natural, including submerged cultural resources, which support such cultural practices and beliefs.

A. Project Background

The Department of Water Supply (DWS), County of Maui, is proposing to improve the 'Ulupalakua Water System portion of the Upper Kula Water System that presently services the 'Ulupalakua/Kanaio area. This section of the 'Ulupalakua Water System consists of approximately five miles of a transmission line extending from the Kama'ole Tank to a reservoir in Kanaio, four branch laterals, water tanks varying in size from 9,000 gallons to 500,000 gallons, valves, pressure breakers, and air vents. The existing transmission line ranges from two inches to six inches in diameter and generally runs along the 3,000-foot contour of Haleakalā's southwestern flank (Figure 1). The four laterals extend *makai* of the main line toward the Kula and Pi'ilani Highways.

Extending approximately one mile to the north of the 'Ulupalakua Water System, to the Kula Sanatorium Tank, is a section of the Upper Kula Water System that is being contemplated for future upgrade. There are no specific plans prepared at this time.

The existing project area water system is old and outdated and does not meet current water system standards. The small-diameter pipelines have insufficient sizes to accommodate current

demand and inadequate capacity to accommodate fire flow requirements. The existing system is not reliable and requires substantial effort by DWS to maintain the lines in proper operating condition and avoid the frequent leakages/breakages that usually accompany aging pipes. While the main transmission line is buried, many of the smaller pipelines were laid mostly at grade or slightly below where they were exposed to agricultural, ranching, recreational, and other activities.

The DWS is proposing to replace the existing lines along the same general alignment as the existing lines. The new lines will consist of larger-diameter pipes to comply with minimum fire flow requirements and current DWS Standards. No new source of water will be developed with this project.

Preliminary archaeological and botanical assessments were conducted in October of 2003 for the transmission line and water lateral corridors. The current Cultural Impact Assessment is a complimentary component to the archaeological and botanical studies, and provides critical information regarding those traditional and cultural practices that may be affected by improvements to the 'Ulupalakua Water System.

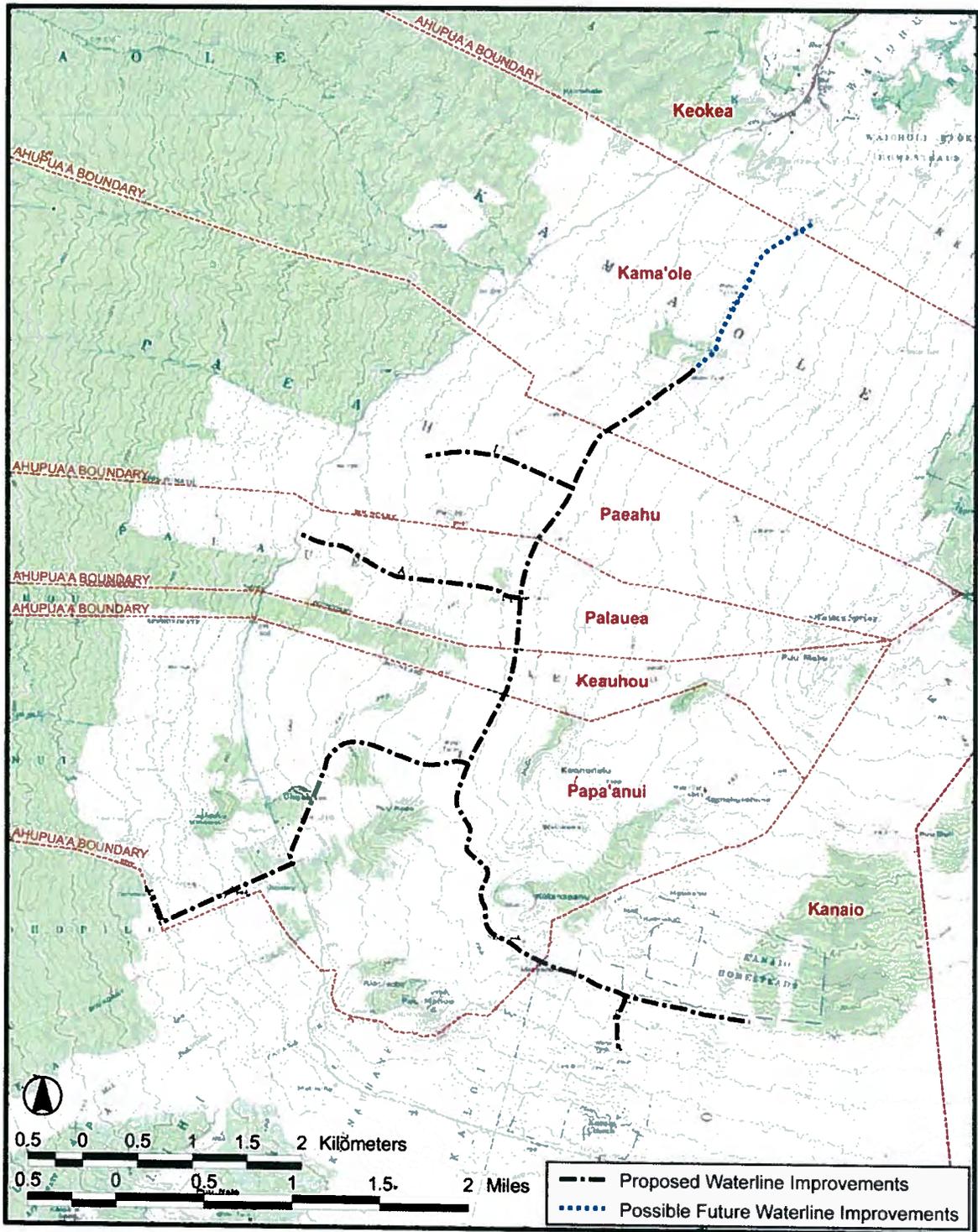


Figure 1. USGS Map Showing Location of the Project Area

B. Scope of Work

In compliance with the Office of Environmental and Quality Control (OEQC) and Act 50, the following Scope of Work (SOW) was designed to satisfy the requirements of a cultural impact assessment as it relates to the identification of traditional Hawaiian customs and rights within the project area.

- 1) Examine historic documents, Land Commission Awards, and historic maps, with the specific purpose of identifying traditional Hawaiian activities. Such activities would include the gathering of plant, animal and other resources, in addition to agricultural pursuits, as may be indicated in the historic record.
- 2) Review existing archaeological information pertaining to site distribution, as this may enable us to reconstruct traditional land use activities, as well as identify and describe past and/or present cultural resources, practices, and beliefs associated with the trail.
- 3) Conduct limited oral interviews with persons knowledgeable about the historic and traditional practices in the project area(s).
- 4) Preparation of a report on the above items summarizing gathered information as related to traditional practices and land use. The report will assess the impact of the proposed action on the cultural practices and any features identified.

C. Methodology

1. Historic Research

Historic documents, maps and photographs were researched at: the Hawai'i State Archives; Hawai'i State Survey Office; Bernice Pauahi Bishop Museum archives and library; the State Historic Preservation Division (SHPD) Library; and the Cultural Surveys Hawai'i Library.

2. Identification of Knowledgeable Informants

Hawaiian organizations, government agencies, community members and cultural and lineal descendants with ties to the Kula, 'Ulupalakua, and Kanaio area were contacted to (1) identify potential knowledgeable individuals with cultural expertise and knowledge of the project area and the surrounding vicinity, and (2) to identify cultural concerns and potential impacts relative to the project area. An effort was made to locate informants who either grew up in near the project area or, in the past, used the project area for traditional and cultural purposes. In addition, informal talk-story with community members familiar with the project area was ongoing throughout the consultation period. The organizations and agencies consulted included: the State Historic Preservation Division; Maui/Lāna'i Island Burial Council; Office of Hawaiian Affairs; Alu Like, Inc.; Maui Hawaiian Civic Club; Department of Hawaiian Homelands; Maui Community College; and individual departments of Maui County.

II. TRADITIONAL AND HISTORICAL BACKGROUND

A. Mythological and Traditional Accounts

Place name analysis can sometimes yield insight into patterns of life in an area. Literal translations of several of the place names for land areas and divisions near to the project area are listed below. Unless otherwise noted, the translations are taken from Pukui *et al.* (1974).

1. Place Names in the Vicinity

<i>Moku:</i>	Kula:	"plain"
<i>Ahupua'a:</i>	Kēōkea:	"the white sand"
	Kama'ole:	"childless" (or "barren"--Fredericksen, et al. 1994:3)
<i>Moku:</i>	Honua'ula:	"red land";
<i>Ahupua'a:</i>	Paeahu:	"row [of] heaps"
	Palauea:	"lazy"; originally spoken with the 'okina by <i>manaleo</i> (native speakers), Palau'ea may also may have been named for the particular type of sweet potato grown in the area (Nathan Napoka, personal communication, 2004)
	Keauhou	"the new era", "the new current"
	Kalihi	"the edge"
	Waipao	"scooped water"
	Papa'anui	"big strong hold" (Pukui and Elbert 1986)
	Kaunuohane	unknown
	Kalo	unknown
	Kanaio	"the bastard sandalwood tree"

1. Traditional Accounts

In reference to Kula, Pukui (1983) offers several *'ōlelo noe'au* or poetical sayings associated with the lands traversed.

'Āina pua'a a Kukeawe
The pork-eating of Kukeawe

Pukui explains:

Said of a person who is not satisfied with the number of his own pigs and so robs his neighbors of theirs. Kukeawe was a friend of Kahekili who was allowed to help himself to any of Kahekili's pigs in Kula, Maui. But Kukeawe also took the pigs belonging to the people of Kula, Honua'ula, and Kahikinui and plundered their possessions. These people rose in rebellion, led by 'Opū, and surprised the followers of Kukeawe while they were ascending Haleakalā on the way to Kula.

Kukeawe's party retreated but found their way blocked by other parties led by Kawehena, Kaho'oluhina, and Kuheana. Kukeawe was killed and his body set up at Palaua for all to see. (Saying 88, 1983:12)

A second saying reported by Pukui is:

Kula unahi pikapika he'e

Kula people, scalers of the suckers of the tentacles of the octopus

Pukui explains:

Said in fun of the people of Kula, Maui. A Kula chiefess who lived inland did not know what the suckers on an octopus were and tried to scale them as one scales a fish. (Saying 1911: 205)

A third saying reported by Pukui is:

O Kula I ka hoe hewa.

Kula of the ignorant canoe paddlers.

Pukui explains:

Said of Kula, Maui whose people did not know how to paddle canoes because they were uplanders (Saying 2473: 270).

A fourth saying reported by Pukui is:

Nā keiki uneune māmane o Kula.

The lads of Kula, who tug and pull the *māmane* up by the roots.

Pukui explains:

An expression of admiration for the the people of Kula, Maui, who accomplish whatever they set out to do. (Saying 2238: 245)

Finally, a fifth saying reported by Pukui is:

O ka wai kau no ia o Ke'anae; o ka 'ūlei ho'owali'uwala ia o Kula.

It is the pool on the height of K'anae; it is the 'ūlei digging stick for the potato [patch] of Kula.

Pukui explains:

A handsome young man of Kula and a beautiful you woman of Ke'anae, on Maui, were attracted to each other. She boasted of her own womanly perfection by referring to her body as the pool on the heights of Ke'anae. Not to be outdone, he looked down at himself and boasted of his manhood as the digging stick of Kula.

The above sayings about Kula highlight the fact that Kula was good land for agricultural pursuits. There are several sayings referring to the lack of coastal or sea faring knowledge, which made the people of Kula appear ignorant or stupid. These sayings were rooted in the fact that Kula people lived far from the sea and were not familiar with the ways of coastal peoples. The sayings about the seafaring ignorance of Kula people, however, are tempered by sayings of admiration for their skill and perseverance at working the land.

In reference to 'Ulupalakua and Kanaio, Pukui (1983) makes the following offerings:

Ka ua Lanipa'ina o 'Ulupalakua
The sky-crackling rain of 'Ulupalakua

Pukui explains: "Refers to 'Ulupalakua, Maui" (Saying 1579, 1983:170)

Kohu'ole kāhi wai o Kanaio
Unattractive is the water of Kanaio

Pukui explains (Saying 1817, 1983:196):

A contemptuous expression meaning that something another person has said or done is worthless. A play on *naiio* (pinworm), found in the anus.

Kamakau (1961:142) relates an account of a lesser chief on Maui during the 1780s, with references to Kula, Wailuku, and Kama'ole:

During this period there were disturbances among the country people, not only on Oahu but also on Maui. The trouble arose through one of the lesser chiefs (*kaukauali'i*) named Kū-keawe, a favorite (*aikāne*) of Ka-hekili to whom Ka-hekili had given the privilege of letting his pigs run over the land of Kula and roasting them as he needed them. But he seized also the pigs belonging to the country people of Kula, Honua'ula, and Kahikinui, as far as Kaupō, and went with a large party to rob them of their wealth even with violence. This was the cause of the uprising of the country people called the "Battle of the pig-eating of Kū-keawe" ('Aipua'a-a-Ku-keawe). When the plundering party reached Kaupō they were surprised by some fighting men of Kahikinui, Honua'ula, Wailuku, and Waihe'e. . . they climbed the mountain of Haleakalā in order to descend to Kama'ole in Kula. . . Here they were surrounded by Ka-wehena's men, Kū-keawe was killed, and his body stuck up like an image toward the sea of Palauea.

There are many legends of the swift retribution by Pele, the Hawaiian fire-goddess, on those who dared to offend her. In historic times Pele is believed to have shown her wrath or her favor by sending down destructive lava flows (Beckwith 1970: 190). Keokea has one such story as told to Edward Hew in his youth (Interviewed November 14, 2003, Appendix B):

I don't know if you believe this kind, but my mother told us...that's when Haleakalā was active before, when my mother was her age yeah (Tiare – 3 yrs. old)...and then they say that Pele come over to their house and she can change yeah? From ahh, I guess Hawaiian to *Haole* to Portagee...whatevah. So from when I was very small growing up we see anybody, wherever, don't play games, don't make fun of them ... stuff like that...because that could be Pele yeah? One more I can tell you is this *Haole* told us about down Rice Ranch yeah? But I heard this from my mother already, that Pele went come this people's house and wanted food and they went chase her away,...chase her away. So...she sends the volcano yeah? The fire...

But as I was saying, Pele went send the fire to burn the house yeah of the people? They went run from the house, run down to there ... right below here (Kēōkea Park) ... you cannot see it from here. But if I take you, I can show you the footprints. It burnt all of them, the father, mother, and one child. And get the footprint (in the lava) of the mother,

father, and the baby. Only one small kid. And Rice told me and then he had show me. He told me what happened...the *Haole* now. So anyway what is now wasn't as bad as the olden days.

B. Pre-Contact Setting

The division of Maui's lands into political districts occurred during the rule of Kaka'alaneo, under the direction of his *kahuna*, Kalaiha'ōhi'a (Beckwith 1940:383). This division resulted in twelve districts during traditional times: Honua'ula, Kahikinui, Kaupō, Kīpahulu, Hana, Ko'olau, Hāmākua Loa, Hāmākua Poko, Ka'anapali, Lahaina and Kula. The study area is located on the leeward flank of Haleakala in the traditional districts or *moku* of Kula and Honua'ula (Figure 2). The project corridors cover the *ahupua'a* of Kēōkea and Kama'ole within the *moku* of Kula; in addition to the *ahupua'a* of Paeahu, Palauea, Keauhou I, Keauhou II, Kalihi, Waipao, Papa'anui, Kaunuaheane, Kaloi, and Kanaio within the *moku* of Honua'ula. Previous research on pre-contact occupation in the *moku* of Kula and Honua'ula has suggested a bimodal model of permanent residence (Kolb *et al.* 1997, Cleghorn 1975, and Cordy 1977). Most permanent habitations were in the uplands, while on the coast there was a smaller permanent habitation component (with an intermediate barren or transition zone).

1. Settlement of Kula

Kula was famous for its upland *'uala* (sweet potato) "plantations" (Handy and Handy 1972:511). The combination of good soil developed in volcanic ash, cool temperatures and frequent clouds to lower evapo-transpiration and bring moisture as fog drip, and rainfall distributed fairly evenly throughout the year would also have allowed for taro cultivation for subsistence by Hawaiians living in the uplands of Kula on a permanent basis. In contrast, water was notably scarce along much of the coast.

Informants for Handy and Handy (Ibid.) in the 1930s placed a "considerable population" on the "lower westward slopes of Haleakalā " This information is supported by the findings in the uplands of Kēōkea and Waiohuli of numerous archaeological sites of prehistoric age (Brown and Haun 1989; Kolb *et al.* 1997). Additional support for this is an abundance of heiau - 33 total recorded in the archaeological survey of Maui by Winslow Walker (1931) - in the district of Makawao between roughly the 2000 ft to 3000 ft elevation contours (see Figure 5). This provides an image of extensive agricultural fields across open land in prehistoric times, much as Kula appears today. Jarves (in Kuykendall 1980:313) describes the Kula area in July 1846 in the midst of the cash cropping boon of Irish potatoes there"

It ranges along the mountain (Haleakalā) between 2000 and 5000 feet elevation, for the distance of 12 miles. The forest is but partially cleared, and the seed put into the rich virgin soil.

This would seem to suggest that prehistoric occupation in Kula was dispersed, possibly with the swidden-type agriculture. Substantial forest clearing does not appear to have occurred until the mid-1800s for commercial agriculture, especially potatoes and sugar cultivation throughout most of Kula during the Mahele period.

1. *Traditional Setting of Honua‘ula*

The origin of the district name is often associated with the literal translation of Honua‘ula as “red land” (Pukui et al. 1974: 51). However, as Donham (1997: 6-7) points out, the association of the literal translation of Honua‘ula with a district or *moku* would be far more appropriate for other areas of Maui where the soils are distinctively red in color rather than the black lava fields and predominantly dark brown to brown soils of the Honua‘ula. A more likely explanation for the origin of the district name is given in Beckwith (1970: 352, 353) and summarized in Fornander (1996: 52.) Honua‘ula was the name of a traveling companion accompanying Mō‘ikeha on their voyage from Kahiki to Hawai‘i. Mō‘ikeha is of the Maweke chiefly line, and along with the Pa‘ao lineage, it is said that these two families are of great importance to the early colonization of Hawai‘i from North Tahiti. Beckwith (1970: 352, 353) writes:

Olopana settles in Waipi‘o on Hawaii and Lu‘ukia, grand-daughter of Hikapoloa of Kohala, becomes his wife. They are driven out by a flood and retire to Kahiki where some say Moikeha is living, others that he was with Olopana in Waipi‘o. Mō‘ikeha becomes infatuated with Lu‘ukia and Olopana raises no objection; but a rival suitor, Mua, who cannot win her favor, pretends to her that Mō‘ikeha is defaming her publicly, and she will have nothing more to do with Moikeha. The chief therefore leaves his lands under the care of Olopana and paddles away in a canoe manned by companions whose names, as recorded, are perpetuated as place names on the Hawaiian group...On the journey from the south the party touches first at the easternmost point of Hawaii and the younger brothers remain at Puna; the kahunas Mo‘okini and Ka-lua-wilinau make their home at Kohala; Honua-ula lands in Hana on Maui.

The implication here is that the origin of the name for Honua‘ula district may not be in the literal translation of the land as “red earth” but for the traveling companion of Mō‘ikeha known as Ho-nua-ula.

a. Settlement of Honua‘ula

Extending from the coastline to the summit of Haleakala, the *moku* of Honua‘ula, one of twelve traditional districts on the island of Maui, is situated between that of Kula and Kahikinui. Within Honua‘ula *moku* there are 18 additional land divisions or *ahupua‘a*; however, the government survey conducted by Alexander et al. in 1866 (Figure 3), as well as current USGS maps, show few boundaries between the place names as most of the boundaries were dropped in favor of those for large land grants (e.g. Torbert plantation area, Torbert and Wilcox Grant 234) (Barrere 1975: 41.) As a result of this, modern maps show the traditional *ahupua‘a* of Keauhou divided in two and no boundaries for the adjacent *ahupua‘a* of Kalihi, Waipao, and Papa‘anui.

The *ahupua'a* of Keauhou extends from the coastline to just above Pu'u Makua and likely encompassed the Keauhou section of the L. L. Torbert Royal Patent Grant 120 and the LL. Torbert and W. Wilcox Royal Patent Grant 234. According to *Place Names of Hawaii*, the literal translation of Keauhou is "the new era" or the "new current". Not much could be found on the origins of the name for this particular *ahupua'a*; however, the division of Keauhou into Keauhou I and II deserves closer attention. A section of Keauhou *ahupua'a*, approximately 194 acres, was awarded to Hoomanawanui by Land Commission Award (L.C.A) 6715 (Figure 4) in 1852. In 1856, Hoomanawanui and her husband Hikiau sold the Keauhou land to James Makee for \$1000.00 (Barrere 1975: 38). In the deed, this portion of Keauhou is referred to as "Hikiau Keauhou" in order to distinguish it from the government held portion of Keauhou, a section of which included the Torbert and Wilcox Royal Patent Grant 234 (Barrere 1975: 38). It seems apparent that the portion of Keauhou that was awarded to Hoomanawanui and deeded to Makee in 1856 was surveyed by W.D Alexander et al. (Figure 3) as an *ahupua'a* separate from government held Keauhou and perpetuated during the Hawaii Territory Survey conducted by Walter E. Wall in 1923 (Figure 4). The government held section of Keauhou, in addition to Kalihi, Waipao, and Papa'anui were all surveyed as a single *ahupua'a* in favor of Torbert and Wilcox Grant 234. Thus the modern *ahupua'a* of Keauhou I and Keauhou II and the lack of land divisions between Kalihi, Waipao, and Papa'anui.

In 1850, under Royal Patent Grant 234, Linton L. Torbert and William Wilcox purchased 1986.00 acres at one dollar per acre. The main purpose of this purchase was for the cultivation of Irish potatoes in an effort to cash in on the "potato boom" of the California Gold Rush. In 1851, however, Linton Torbert faced bankruptcy and in an effort to avoid financial ruin assigned his holdings by trust deed to Captain James Makee (Fredericksen and Fredericksen 1998: 10). At auction, conducted by his own order, Captain Makee purchased all of the Torbert holdings on January 23, 1856 (Ibid.)

b. Traditional Subsistence of Honua'ula

The core written sources for summarizing the traditional subsistence practices for this area of Maui are found in *Waile'a: Waters of Pleasure for the Children of Kama* by Barrere (1975), *Native Planters* by Handy, Handy, and Pukui (1991) and the *Native Hawaiian Ethnographic Study for the Hawai'i Geothermal Project Proposed for Puna and Southeast Maui* by Matsuoka et al. (1996.) Handy et al. write:

All the country below the west and south slopes of Haleakala, specifically Kula, Honua'ula, Kahikinui, and Kaupo, in old Hawaiian times depended on the sweet potato. (S)ome upland taro was grown, up to an altitude of 3,000 feet...(t)here was excellent deep-water fishing available to the folk of Kula and Honua'ula ... (p. 276.)

Matsuoka *et al.* (1972) imply that the people of southeastern Maui followed a seasonal settlement pattern dependent upon the variations in rainfall. Based on oral testimony, it was established that inhabitants of this area lived at upland habitations, where planting could be done year round, during the dry period and migrated to the lowland coastal region during the rainy season. In the lowland areas, planting was done in conjunction with the rainy season where each family cultivated plants at habitation sites along the coast (Matsuoka et al. 1996: 73.) The eastern and coastal portion of Honua'ula was thickly populated by Hawaiian planters (Handy and Handy, 1972). Matsuoka et al. write:

The entire area of Honua'ula was highly cultivated ... It is important to note that later, when lava flows covered the land, people did not move away. Instead, they dug deep holes in the lava and transported soil from the uplands to fill them up. The earth was dug up and the soil passed in baskets from hand to hand along a row of people to fill the "garden holes" in the lava (p. 74).

The use of these "garden holes" as an effective agricultural practice in an otherwise marginal environment is underscored by claims for such areas in testimony to the Land Commission. In the testimony of Kekualike, he lays claim to five *moku mau'u* "the best places for cultivation in our land (Honua'ula)", Paaluhi laid claim to one *moku mau'u* at Papaanui and Kaumana claimed four. The translator notes that there is no data on the term *moku mau'u* but believes it refers to an arable pocket of soil in rocky terrain. As attested to by Le Perouse (1798: 345), there was some animal husbandry practiced in the Honua'ula area along with cultivation of bananas and dry land taro. However, the primary subsistence practices in this leeward environment centered on fishing and sweet potato cultivation.

C. Historic Economy and Land Use

The most significant marker in the change of land-use patterns and allocation came with The Great Mahele of 1848 and the privatization of land in Hawai'i. This action hastened the shift of the Hawaiian economy from that of a subsistence-based economy to that of a cash based economy. During the Mahele, all the lands in the Kingdom of Hawai'i were divided between *mō'i* (king), *ali'i* and *konohiki* (overseer of an *ahupua'a* division), and *maka'āinana* (tenants of the land) and passed into the Western land tenure model of private ownership. On March 8, 1848, Kamehameha III further divided his personal holdings into lands he would retain as private holdings and parcels he would give to the government. This act paved the way for government land sales to foreigners and in 1850 the legislature granted resident aliens the right to acquire fee simple land rights (Moffat and Fitzpatrick 1995: 41-51.) In many cases these land sales to foreigners were vast and often encompassed entire *ahupua'a* and *'ili* such as the case at Keauhou, Kalihi, Waipao, and Papa'anui with the Torbert Grant 120 and the Wilcox and Torbert Grant 234.

1. *Historic Kula*

In 1820, the whaling industry was introduced in Hawai'i. Although the immediate whaling activities centered on Lahaina, the Kula area felt the effects in the form of increased agricultural demands. The introduction of whaling to the Maui community brought with it an increased demand for foodstuffs and in particular the long-lasting Irish potato. As a result, after 1830, dry-land agriculture in the Kula District expanded with a particular focus on Irish potatoes. The California Gold Rush of 1849 added an additional demand as a California-Hawaii potato trade began to flourish. Kula came to be known as "the potato district" (the area between 2000 and 5000 ft amsl) as it was the area of highest potato production in the Kingdom. From 1830 to 1850 potato production thrived in Kula until successful potato cultivation and production in California and Oregon resulted in a decline in the Hawai'i trade (Burgett and Spear 1995:6-7). Donham (1992:5) notes that the increase in land clearing and cultivation associated with the Gold Rush resulted in "deforestation [which] adversely affect[ed] the amount of rainfall in the district, and periods of drought became more common.

The increase in agricultural production associated with the potato industry encouraged many Hawaiians to venture into cash-cropping (Speakman 1984:116) and attracted Chinese immigrants to Kula in the 1840s. During the subsequent 30 to 40 years the Chinese created a thriving community in the uplands (Burgett and Spear 1995:7).

According to Speakman (1984:140), even though the Kula land was hard, with scattered rains and common droughts, "the Chinese who lived and worked around Kēōkea enjoyed the healthiest climate to be found almost anywhere; they also enjoyed themselves and became good friends and neighbors of the Hawaiians living there. "During this time period sugar cultivation and ranching were established in the Kula region. Sugar was present prior to 1846, with six sugar producers operating on the slopes of Haleakalā (Wong Smith in Brown and Haun 1989:C-7). As Wong Smith points out (Brown and Haun 1989:C-6), ranching was present in the area prior to the 1840s, and along with agriculture, would continue to be important activities in the Kula area. During the 1970s, Kula produced the majority of Hawai'i's locally grown produce; livestock ranches comprised most of the remaining land use. At present, non-residential areas are still in use as centers of agricultural production, particularly in the "potato district" of Kula (Donham 1992:5).

1. *Historic Honua'ula*

With vast holdings in Honua'ula, Linton Torbert established the Torbert Plantation which accelerated the Irish potato boom in Honua'ula and catered to the California Gold Rush. The Torbert Plantation holdings included a road and landing at Mākena to expedite shipping. As in the Kula area, the historic agricultural boom in Honua'ula attracted Japanese immigrants to the Ulupalakua and Kanaio area. Unlike the open pastures of the modern era, the hills of 'Ulupalakua were historically covered in *pamakani*. This fuzzy vine made raising horses, grazing cattle, and farming the land difficult. As a means to clear the forest and *pamakani* ground cover in the early 1900's, large landholders in the upland areas handed out agricultural leases on parcels cleared by immigrant and local labor.

Then in 1856, as previously discussed, Captain James Makee purchased the Torbert holdings, established Rose Ranch in 1864, and changed Makena into one of the main ports on Maui (Fredericksen and Fredericksen 1998: 10.) By 1865, Honua'ula residents had adapted to the changing economic structure of Hawaii and were either employed by Rose Ranch or McPhee (Mrs Annie Wilmington, personal communication.) Families had settled in permanent structures either along the coastline or near the ranch at 'Ulupalakua and occupied these settlements year round rather than seasonally. Economically, the upland inhabitants depended on ranching and agriculture, also retaining a close relationship with the coastal population of Honua'ula for marine resources. Mrs. Annie Wilmington, an original resident of the Makena region, recalled (Lee-Greig 2003):

During that time plenty people lived (there). That's where all the family lived yeah? So they have their home here and homes there and down the beach. We have *akule* fishing, Lu'uwai you know the one, he always get the school (of fish) so he watch that school till it gets close, and when it gets closer they use the umm ... somebody else throw the net, then they get the fish further in, then they throw net again, then they get the fish further in, then they throw the net again, take this piece off, take this piece off, then he gets closer to the shore, then they start, then we don't know where (how) the people know that we have *akule* surrounded, the whole place is

full...Kula people come, Wailuku people come on horseback. They come there and wait, and it's worth it because they help pull the net, you always have quite a bit of fish...that's one thing, the Hawaiians, they don't believe in selling the fish. What they do is, with Tutu Kapahu, everybody ... everybody, whether is family or not, they always give about six fish a piece, and then if you want to buy (more) maybe forty fish for two dollars ... in those days. That's one thing with Tutu Kapahu, he's very generous. Everybody have fish to go home, forty fish, they give plenty yeah? They give everybody forty fish to go (take) home. And then the Chinese people buy too, you know, because plenty fish?

After the development of Kahului Harbor in the 1920's, commercial shipping at the Makena Landing ended and the area saw a decline in population. Finally, with the onset of World War II, the population of Makena suffered additional population decline and shoreline habitation in Honua'ula changed.

Military activities, including amphibious beach landings were conducted all along the coastline. The military also graded roads from Kīhei to Mākena, sometimes following an old horse trail. A more direct impact of the war and military on the population and residents of coastal and upland Honua'ula was the purchase or confiscation of lands along the shore. Mrs. Wilmington recalled (Lee-Greig 2003: 1-11):

When the war started coming, they told everybody from the beach they had to move. They (the people) were selling their homes. So my grandma, we had a big house, we cannot sell it, cause she has to do it because the house was under her name...she turn around and she says no that's not my house, that's 'ohana's house that's our father's, but the others got good money for their homes. But they (the military) took all the homes so we didn't get anything but fifty-dollars for it.

We had to (go), the houses were all broken down...everybody, we already moved to 'Ulupalakua, my brothers all went to 'Ulupalakua School, and so I moved to 'Ulupalakua.

The implication of this is that while the coastal regions of Honua'ula experienced a decline in population, the upland region of 'Ulupalakua and Kanaio saw a slight increase in population.

D. Summary

Mythology regarding this portion of Maui is relatively scarce and traditional accounts focus on political activities. Accounts record the struggles and activities of Maui and Hawai'i chiefs in the 1700s, including Ke-kau-like, Alapa'i, Ka-hekili, Kū-keawe, 'Umi, and also British Captain Vancouver. The sand beaches along Kīhei's shores were used as landing and staging areas during these armed conflicts.

During the early historical period Kula's agricultural role was expanded as the introduction of whaling in 1820 and the California Gold Rush of 1849 created a demand for the Irish potato, which was cultivated in the uplands. The traditional 'uala planting grounds were now also used for the Irish potato, and the area became known as the "potato district." Immigrants from China came to Makawao during this time and created a thriving community in Kula. Sugar cultivation and ranching were also introduced into Makawao in the early 1800s.

Many of the people who had claims in Kula had the chiefly status that allowed them to actively engage in the international economy, which were potatoes for cash. Kalepolepo flourished as a major entrepot in the period from the 1830s to the mid 1870s.

The late 1800s were marked by the continuation of ranching and sugar in Makawao. Lower Kula consisted primarily of pastureland by the end of the century. By the late 1800s, Hawaii Commercial and Sugar Company became a major presence in Makawao with its absorption of other neighboring operations.

III. PREVIOUS ARCHAEOLOGICAL RESEARCH

Numerous archaeological studies have been conducted in the Kīhei area; however, despite the massive development on both the seaward and inland sides of South Kīhei Road (to the west of the current project area), there have been only a few archaeological studies near to the current project area. Kennedy's (1986c) archaeological reconnaissance of 160 acres included some of the current project area. However, with the limited coverage of the reconnaissance survey, Kennedy located no historic properties within his entire 160-acre area, including the current project area (Kennedy 1986c). Because of the paucity of studies in the immediate area, it seemed appropriate to examine studies throughout Waiohuli Ahupua'a and in adjacent *ahupua'a* to the north and south. The studies that are more relevant and that can be used to predict the site types that are likely within the current project area are summarized below.

A. Summary of Previous Archaeology

As a perusal of the above studies shows, the majority of archaeological surveys in the Kīhei area have produced no significant archaeological data at all. While this may be due in large measure to changes on the land associated with ranching, military occupation and resort and housing construction it still seems inescapable that few areas in the Hawaiian Islands abutting sandy beaches have less in the way of Hawaiian cultural deposits than Kīhei. A number of archaeological studies (Kennedy 1986c, Kennedy 1990b, Watanabe 1987) on the slopes inland from Pi'ilani Highway have identified no archaeological sites at all. Other projects in these lower slopes have, however, identified agricultural features (Chaffee et al. 1997) military sites (Mayberry and Haun 1988) and enclosures with a posited pre-contact habitation function (Fredericksen et al. 1994c).

The few available radiocarbon dates from the general vicinity of the current project area are consistent in their rather broad, later prehistoric age determinations, most commonly post A. D. 1500 (Fredericksen and Fredericksen 1995b; Fredericksen 1994; Fredericksen et al. 1993). This fits with the model that the more intensive use of the Kīhei area was a later prehistoric development that corresponded with the expansion of upland permanent habitation, ceremonial constructions, and agricultural clearing after A. D. 1400-1500 (Kolb et al. 1997:281-282).

Evidence of earlier coastal habitation in the Kīhei area has recently come to light at excavations adjacent to the site of the Kalepolepo Church. The recent excavations described in McDermott et al. (2000) and McDermott (2001), in conjunction with those of Pepalis and Kolb (1999 in press), provide evidence in the form of charcoal concentrations, midden deposits, 14C dates, and palynomorph identification, indicating settlement in the vicinity of an inland pond feature by c. A. D. 600-900. This new evidence for early habitation in coastal Kīhei needs to be corroborated by additional study. It is unlikely that similar early land use took place within the current project area because of its dry, barren condition.

The archaeological investigations nearest to the current project area are those of Kennedy (1986), Watanabe (1987), Chaffee et al. (1997), Hammatt and Shideler (2000), Kikilo'i et al. (2000), Donham (1989, 1990), and Miura (Bordner and Cox) (1982). The results of these investigations can be used to determine what historic properties are likely within the current project area. As noted above, Kennedy's (1986) reconnaissance of 160 acres in the immediate vicinity (and including portions of) the current project area found no historic properties.

Table 1 Previous Archaeological Studies Not Depicted on a Map Due to Lack of Accurate Location Information.

Study #	Author	Year	Ahupua'a	TMK	Results
	Stokes	1918	Island-wide	--	Heiau Documentation: Heiau of Nanahu, land of Makena; on the point north of Makena "Bay. This was a pavement of 'a'a and coral fragments, level with the surrounding ground and rocks, and about 20 feet square. The only information to be gathered was that it was "a heiau for dead people." It was not a graveyard, and I do not understand nor could the local people explain to me the meaning of their description. Heiau of Wailuku, at Kawililipoa, land of Kama'ole, inland; said to be a platform. Not seen. Heiau of Kolea, at Kawilipoa, land of Kama'ole, Said to have been for human sacrifice Not seen. Heiau at Kawililipoa, land of Kama'ole; between the road and the beach. This foundation, which had been destroyed, was probably a platform originally. It was situated on a sandy flat; quarter of a mile from the sea; 200 feet west of the road, and from 200 to 3000 feet south of the Mormon church
	Thrum	1918	Islandwide	--	Heiau Documentation: Heiau Mo'omuku, for sacrifice; between Makawao and Kula. Not seen. P.126; Nanahu Heiau,, on point, north of landing at Makena. A pavement of pebbles and some coral, about twenty feet square and level with ground. No other features. Said by several natives to be a heiau "for dead people." Probably only a sacred place without temple structure. p. 127-128.
	Thrum	1921	Islandwide	--	Heiau Documentation: Kalailani, Ke'ekeehia, and Kamahina, as also Kalaniana at Keawakapu, were heiau in the 'Ulupalakua section in olden time. They are all gone. The heiau know as Wailuku, in Kama'ole, Kula (formerly reported), was visited and found to be of the platform-type, some 40x60 feet in size, in ruins. Its upper end showed a slow terraced wall, while the lower wall must have been ten feet high in its day. This heiau is held to be of the po 'okanaka class, and is much revered for the alleged frequency of drum and other sound emanating therefrom on the nights of Kane.

Study #	Author	Year	Ahupua'a	TMK	Results
	Walker, W.	1931	Islandwide	--	Large Monument Site Documentation: Documented 266 sites on Maui, mainly heiau. In Kama'ole, he recorded five <i>heiau</i> : Wailuku (205), Kolea (206), Keahialoa (208), Papakea (209) and an unnamed structure (207). In Honua'ula, he documented ten coastal <i>heiau</i> , four upland <i>heiau</i> , a coastal village, two fishponds, and a numbe of <i>ko'a</i> . No sites were recorded in Palauea, Paeahu or Keauhou. From Keauhou to Ka'eo, he recorded Nanahu <i>Ko'a</i> , Site 197 (Pōhakupunahaha Heiau), and Sites 200-204 (Heiau Kalailani, Kekeehia, Kalaniana, and Kamahina). In Kanaio, he recorded 12 house sites and associated cultivated <i>kipuka</i> on the trail to Kanaio, burial platforms near the coast, and described segments of the Hoapili Trail. Walker recorded in Kanaio: Site 188 (an unnamed <i>heiau</i>), Site 189 (Kohala Heiau), Site 190 (Manonokohala Heiau), Site 191 (Manokaahia Heiau), Site 192 (Papanuiokane). Site Documentation: Descriptions of selected sites.
	Bruce	n.d. [1973]	Islandwide	--	
	Cordy	1977	Kihei to Paeahu	--	Reconnaissance Survey: 38 sites were identified in all; 13 north of Kama'ole, 12 in Kama'ole (Site 1713-1724) and 13 (Sites 1725-1733, 1735-1737) in Paeahu. Cordy proposed four habitation zones, coastal, barren, transitional, and inland.
	Sterling	1998	Islandwide	--	Site Documentation: Sterling noted in Kanaio a <i>mauka-makai</i> trail, several <i>ko'a</i> , a lava tube with human remains, several unnamed <i>heiau</i> , the villages of Waailio, and Walker's site 188, 189, 190, 191, and 192, all <i>heiau</i> . From Ka'eo to Keauhou, she recorded the Nanahu <i>Ko'a</i> first recorded by Walker, and Walker's Sites 197, 200-204, all <i>heiau</i> . In Palauea, she recorded a <i>ko'a</i> .

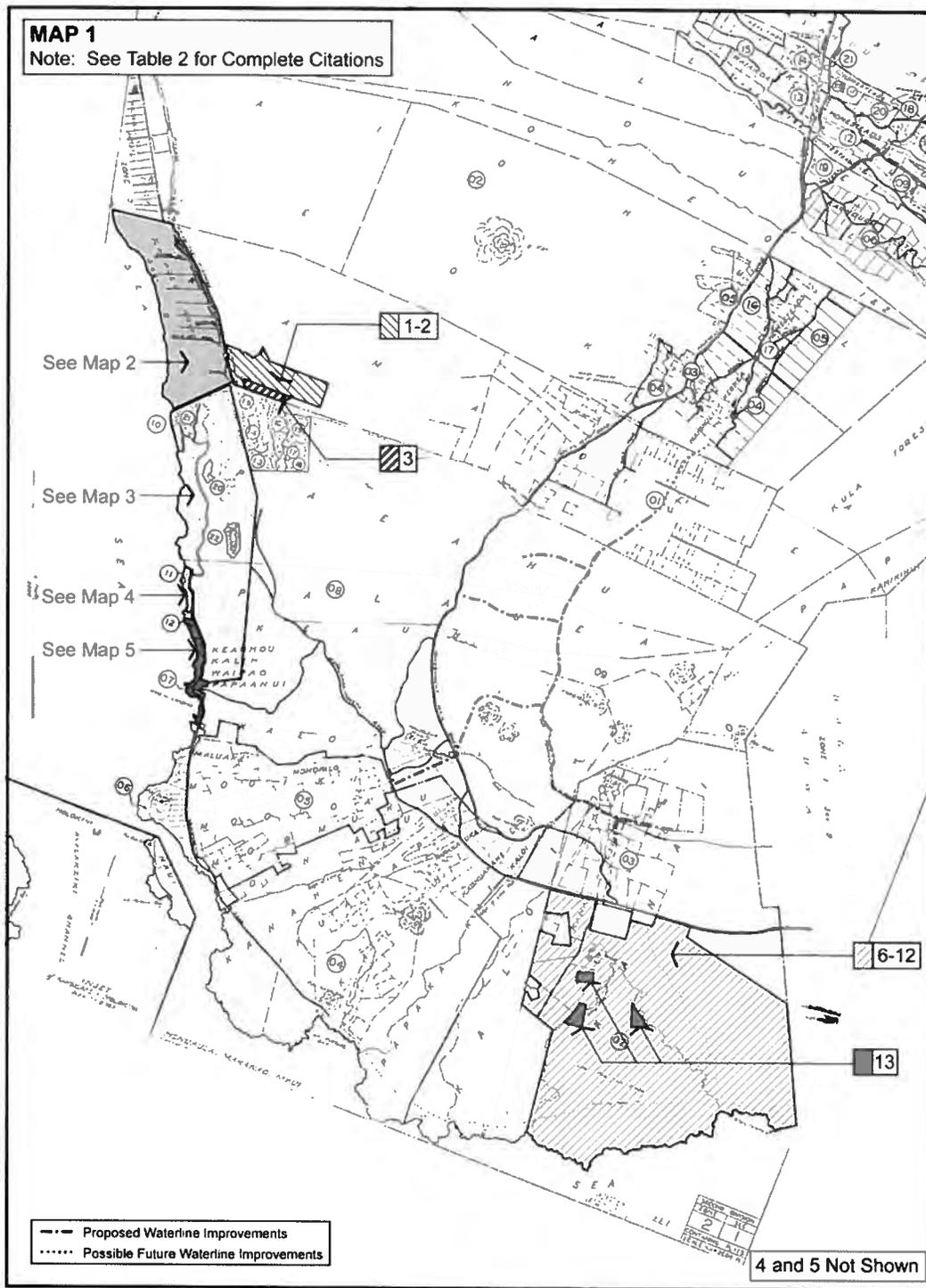


Figure 5. MAP 1 - Base Map - Inland Kamaole through Kanaio (TMK 2-1, 2-2), Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Corridor.

Table 2 Previous Archaeological Studies Depicted on MAP 1 (Figure 6)

Study #	Author	Year	Ahupua'a	TMK	Results
1	Haun	1988	Kama'ole	2-2-02: 02 por.	Reconnaissance Survey of the Maui Palisades Parcel: Identified 33 sites with 68 features, mostly military. This area was revisited by Mayberry & Haun in 1988.
2	Mayberry & Haun	1988	Kama'ole	2-2-02: 02 por.	Reconnaissance Survey: Identified 33 sites in an area first surveyed by Haun (1988)
3	Kennedy	1990b	Kama'ole	2-2-02: 24	Inventory Survey of a Parcel at 300 ft. amsl: No archaeological findings
4	Fredericksen, E., & D. Fredericksen	1999	Kama'ole	2-2-02: 69 por.	Inventory Survey of a parcel at 170 ft. elevation: 3 sites were identified, including 5 small enclosures and a rock pile.
5	Fredericksen, D., and E. Fredericksen	2000	Kama'ole	2-2-02: 69 por.	Data Recovery: Six test units were excavated into an enclosure at Site 50-50-10-4227. Several artifacts were recovered within an enclosure, including many coral file tips, suggesting that fishhook manufactures was taking place at this site.
6	Chapman & Kirch	1979	Kanaio	2-1-02	Data Recovery: Excavations were conducted at seven sites. Site M8 was dated to the mid-15th century; it had early artifact types that suggested it was the earliest site, possibly dating to A.D. 1100.
7	Howarth	1993	Kanaio	2-1-02	Reconnaissance Survey at KNTA: Three caves surveyed, including Site 50-50-14-3912; human remains found in one cave and the beak of an extinct 'Akialoa-like bird
8	Major	1993	Kanaio	2-1-02	Reconnaissance Survey at KNTA: An archaeologist accompanied several biologists on a cave survey; five caves (50-50-14-3912, 3911, 3918, 3909, 1235) had significant archaeological remains, including burials.

Study #	Author	Year	Ahupua'a	TMK	Results
9	Bordner	1994	Kanaio	2-1-02	Site Documentation of sites in KNTA: Recorded over 100 sites in Kanaoi and 'Auahi; no site numbers were assigned; Habitation and agriculture focused on Kanaio village near Honua'ula Church and extending down to Pu'u Pimoe. Habitation in coastal Kanaio focused on Alaha-Wahene [Site 50-50-14-3796] on west kanaio and a second cluster at Wai a Ilio [Site 50-50-14-1481]. The coastal communities were linked by Pi'ilani [Hoapili] Trail and both had trails heading mauka to Kanaio. religious sites around Kanaio; also cluster in eastern Kanaio Homestads property
10	Erkelens	1994	Kanaio	2-1-02	Inventory Survey of road corridor: 51 sites with 233 features recorded.
11	Nees and Williams	1996	Kanaio	2-1-02	Inventory Survey in KNTA (4 parcels) : Seven sites with over 17 features were recorded; three features were possible burial features. Other features were related to pre-contact temporary habitation and post-contact ranching.
12	Eble & Cleghorn	1997	Kanaio	2-1-02	Reconnaissance Survey of KNTA lands (6000 acres): 42 registered sites (50-50-14-572, 1006, 1235, 1481, 1800, 3780-3918) (20% of installation surveyed) were recorded, consisting of pre-contact Hawaiian habitation and agriculture and historic agriculture and cattle ranching features. Eight dates from A.D. 1325-1600 to A.D. 1705-modern were determined.
13	Eble & Tolleson	1999	Kanaio	2-1-02	Inventory Survey and Monitoring of KNTA lands (293 acres). 22 sites (50-50-14-4732 to 4752) with 183 features; at least two have burials

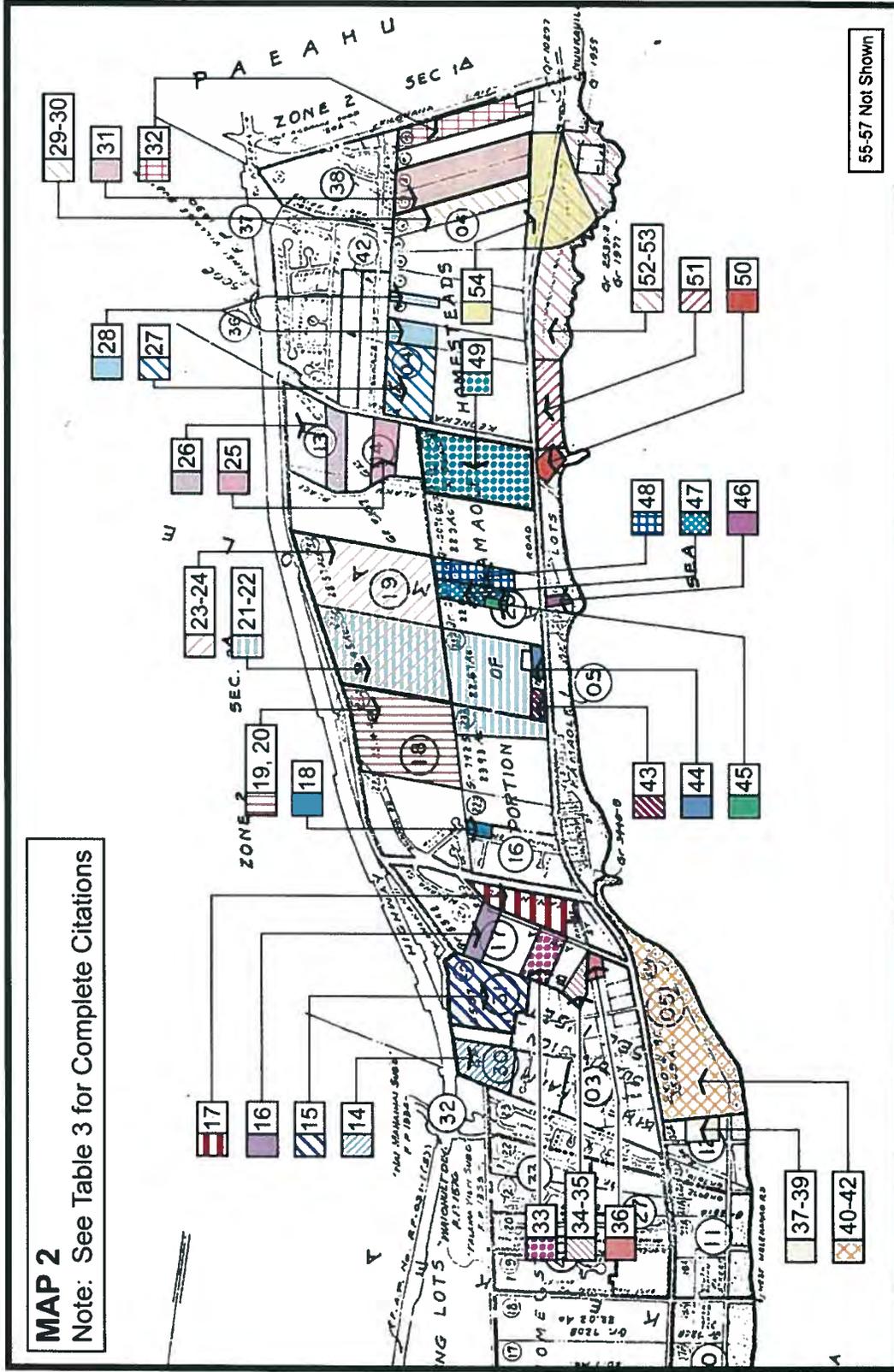


Figure 6. MAP 2 Coastal Kama'ole (TMK 2-3-09), Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Corridor.

Table 3 Previous Archaeological Studies Depicted on MAP 2 (Figure 7)

Study #	Author	Year	Ahupua'a	TMK	Results
14	Fredericksen, D., et al.	1994	Kama'ole	3-9-30: 21	Inventory Survey: 2 sites were identified including a midden scatter & a concrete slaughterhouse foundation
15	Pantaleo	2002	Kama'ole	3-9-17: 34	Inventory Survey: No surface features remained in this heavily disturbed 14-acre parcel. Fifteen backhoe trenches were excavated, but no subsurface cultural deposits were found.
16	Tome & Dega	2002a	Kama'ole	3-9-17: 31	Inventory Survey: One site (50-50-10-5192) with four features was identified, consisting of an alignment and three midden scatters. The site was interpreted as a pre-contact habitation site.
17	Burgett and Spear	1996	Kama'ole	3-9-17: 02, 68, 69	Inventory Survey: One site (State Site 50-50-09-4400) with a stone alignment, a pit feature, and two cultural deposits was recorded. Sparse midden and a few lithics were recovered from test units.
18	Haun & Henry	2000	Kama'ole	3-9-16: 01, 07, 08, 09	Inventory Survey: No surface remains were found in this 1-acre parcel. The north half of the property had been buried under fill.
19	Sinoto	1989	Kama'ole	3-9-18: 01	Inventory Survey: Identified 8 sites, including walls, a possible trail, a rock shelter, and midden.
20	Fredericksen, E., et al.	1994a	Kama'ole	3-9-18: 01	Inventory Survey: 11 sites, consisting of 8 previously identified sites (50-50-10-3531-3541) and three newly identified sites were recorded.
21	Hammatt & Shideler	1989	Kama'ole	3-9-18: 17, 21; 3-9-19: 06; 3-9-20: 20, 27	Reconnaissance Survey of a 54-acre parcel: Identified 8 sites.
22	Hammatt & Shideler	1992	Kama'ole	3-9-18: 17, 21; 3-9-19: 06; 3-9-20: 20, 27	Inventory Survey of a 54-acre parcel: Survey & Testing of Hammatt & Shideler 1989 study area. Identified 2 probable <i>ko'a</i> shrines (Sites 50-50-10-2633 and 2637) among 8 sites.
23	Pantaleo & Sinoto	1991a	Kama'ole	3-9-19: Lot 1-2	Assessment: Nine sites were located, including two historic structures, one occupied between 1910-1930. One platform (Site T-1) had previously been tested by Hammatt & Shideler (1990).

Previous Archaeological Research

Study #	Author	Year	Ahupua'a	TMK	Results
24	Pantaleo <i>et al.</i>	1991	Kama'ole	3-9-19: 04, 07	Inventory Survey: Covered part of same area as Hammatt & Shideler 1989, 1991
25	Leidemann	1989	Kama'ole	3-9-14: 02	Reconnaissance Survey: No archaeological findings, area extensively bulldozed
26	Kennedy	1991	Kama'ole	3-9-13: 01, 10	Reconnaissance Survey: No surface features were noted in this 5.8-acre parcel.
27	Kennedy	1989b	Kama'ole	3-9-04: 134	Reconnaissance Survey of a 16.4-acre parcel: No archaeological findings.
28	Kennedy	1989a	Kama'ole	3-9-04: 132, 135	Inventory Survey: No archaeological findings judged significant
29	Fredericksen, W., <i>et al.</i>	1992a	Kama'ole	3-9-04: 79	Data Recovery: Further work was conducted at Sites 50-50-10-2903, a rock wall, 2901, an historic structure, and 2902, a midden scatter. A human cranial fragment was noted on the ground surface at Site 2902. Thirty-three trenches were excavated in the project area. No additional human bone was found at Site 2902.
30	Kennedy	1992	Kama'ole	3-9-04: 79	Inventory Survey: Identified 4 sites (State site 50-50-10-2900 to 2903) including a permanent pre-contact habitation/religious site (2900) in this 10 acre parcel.
31	Kennedy <i>et al.</i>	1992	Kama'ole	3-9-04: 76, 77, 78	Inventory Survey: Four sites were recorded, a midden (50-50-10-3123) and three historic walls (3124-3126). 29 trenches and 12 shovel tests were excavated around the sites; no significant cultural deposits were found.
32	Sinoto <i>et al.</i>	1999a	Kama'ole	3-9-04: 129	Inventory Survey of the Douglas Spencer Subdivision: One wall segment was recorded (no state site number). No cultural deposit was noted during backhoe trenching.
33	Fredericksen, W., <i>et al.</i>	1991b	Kama'ole	3-9-17: 26	Inventory Survey: No significant archaeological findings (only modern trash)
34	Rotunno-Hazuka & Pantaleo	1991	Kama'ole	3-9-17: 23 Lot 1-B	Reconnaissance Survey of the Diamond Resort Parcel: No archaeological findings. The parcel showed evidence of grubbing and was covered with dense vegetation.
35	Sinoto	1990	Kama'ole	3-9-17: 23,	Reconnaissance Survey: No archaeological findings

Study #	Author	Year	Ahupua'a	TMK	Results
				Lot A & B	
36	Haun & Henry	2001c	Kama'ole	3-9-03: 05	Inventory Survey: No features were found. The ground had been disturbed.
37	Keau	1981a	Kama'ole	3-9-12: 13	Reconnaissance Survey at Kalama Park: One possible <i>ko'a</i> (fishing shrine) and one possible burial site were recorded.
38	Donham	1990a	Kama'ole	3-9-12: 13	Inventory Survey at the Kihei Public Library Project Area: No surface features were located in this 19.3 acre parcel. No cultural material was found in a series of auger tests. Only modern refuse was noted.
39	Burgett et al.	1996	Kama'ole	3-9-12: 13	Monitoring and Data Recovery at the Kihei Public Library Project Area: Five sites were identified; 50-50-10-3998 and 3999 are habitation sites; Site 3942 was a habitation site and <i>ko'a</i> ; Site 3944 was a habitation with possible burial and site 4000 was a scatter of human remains. Radiocarbon dates indicated that habitation stretched from the 13th c. into historic times.
40	Keau	1981b	Kama'ole	3-9-05	Reconnaissance Survey of Kama'ole Beach Park: No archaeological findings. Recent storms did not expose any cultural deposits.
41	Shapiro & Rosendahl	1988	Kama'ole	3-9-05: 52	Reconnaissance Survey: Four backhoe trenches were excavated in the parcel. No cultural deposit was found
42	Neller	1982	Kama'ole	3-9-12: 13; 3-9-05: 52	Reconnaissance Survey: Although no burials were found during the reconnaissance survey, the archaeologists were told that a burial had been found at the park in 1981 during construction activities and a "large number of burials" had been found during construction of the playing field.
43	Fredericksen, E., & D. Fredericksen	2001	Kama'ole	3-9-20: 34, Lots A-2-B	Inventory Survey: A cultural deposit with food midden (Site 50-50-10-5170) was discovered during subsurface testing. A radiocarbon date (220 +/-50 BP dated the site to the late pre-contact early historic period.
44	Neller	1982	Kama'ole	3-9-20: 21	Reconnaissance Survey: construction trenches at Kama'ole.
45	Fredericksen, W., et al.	1989	Kama'ole	3-9-20: 10	Inventory Survey: No surface or subsurface features recorded.

Previous Archaeological Research

Study #	Author	Year	Ahupua'a	TMK	Results
46	Fredericksen, W., et al.	1991a	Kama'ole	3-9-05: 19	Inventory Survey: No significant archaeological findings (2 modern dog burials and a modern trash pit)
47	Hamnett & Shideler	1990	Kama'ole	3-9-20: 09	Reconnaissance Survey: No archaeological findings in this 4-acre parcel.
48	Fredericksen, W., et al.	1990	Kama'ole	3-9-20: 07	Inventory Survey: No archaeological findings
49	Kennedy	1990a	Kama'ole	3-9-04: 05 por.	Inventory Survey: One wall was recorded, probably constructed in the early historic period.
50	Fredericksen, W., et al.	1992b	Kama'ole	3-9-05: 03, 04	Inventory Survey: Backhoe trenching was conducted in a sand dune. There was no cultural deposit.
51	Fredericksen, E.	2002	Kama'ole	3-9-04: 48	Monitoring Report: During monitoring of the 5.86 parcel, two human bone fragments were found.
52	Haun & Henry	2001a	Kama'ole	3-9-04: 01 por., 61 por.	Inventory Survey: Four sites (50-50-10-1034, 3522, 3523, 3524), previously recorded by Sinoto (1978) were relocated in this 8-acre parcel. 59 trenches were excavated in the project area; 39 shovel tests and 7 test units were excavated at Site 1034, the Kamole House Site.
53	Calis	2001	Kama'ole	3-9-04: 01 por., 61 por.	Inventory Survey of the Kama'ole Beach Park: Backhoe trenching was conducted in a sand dune. There was no cultural deposit.
54	Sinoto	1978b	Kama'ole	3-9-04: 01, 67, 87	Reconnaissance Survey: Recorded 6 sites (later consolidated into State sites 50-10-10-3522-3524) and relocated one site (1034), the Kama'ole House Site.
55	Cox	1976	Kama'ole	--	Reconnaissance Survey of road corridor in barren zone. Six sites (50-09-219-224) were identified in the road corridor; only 224 (cave shelter) is in Kama'ole; limited excavations were conducted at sites 219 (ahu) and 224; one volcanic rind date of A.D. 1724-1784 was determined for Site 224
56	Folk et al.	1999	Kama'ole	2-2; 2-3	Reconnaissance Survey: 23 sites were recorded during the survey, five sites are in Kama'ole: CSH 9 (complex of 30+ features), 10 (enclosure), 11 (wall), 12 (wall and ahu), and 14 (mound).
57	Fredericksen, E., et al.	1994b	Kama'ole	--	Data Recovery: Work at Site 50-50-10-2636, a cultural deposit. A radiocarbon date of A.D. 1295-1495 was returned.

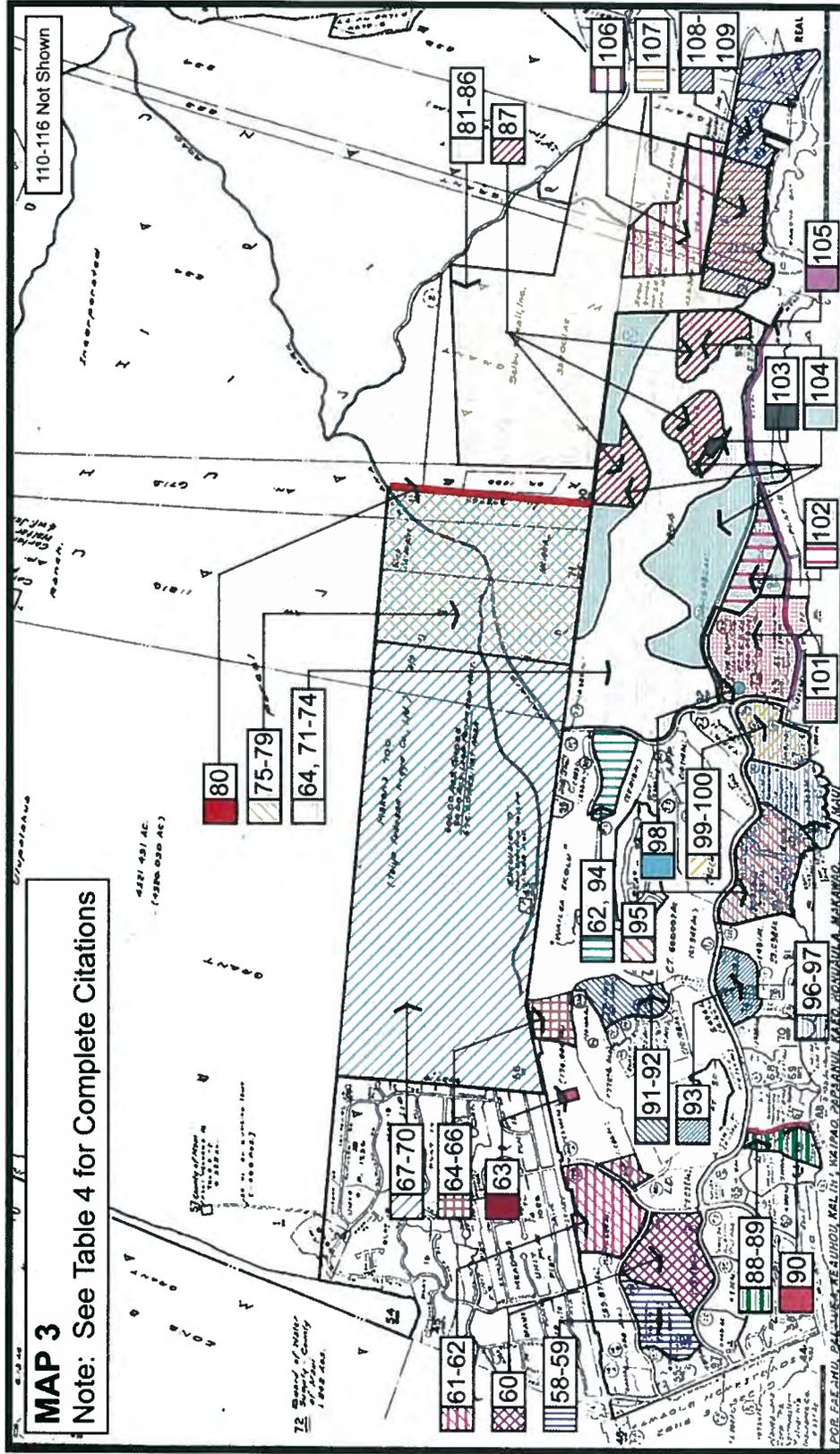


Figure 7. MAP 3 Inland Paeahu to Keauhou (TMK 2-1-08), Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Corridor.

Table 4 Previous Archaeological Studies Depicted on MAP 3 (Figure 8)

Study #.	Author	Year	Ahupua'a	TMK	Results
58	Pantaleo & Sinoto	1991b	Paeahu	2-1-08: 115	Assessment: of the Wailea One Parcel (23.95 acres): One wall was recorded, but was not given a site no.
59	Sinoto et al.	1999b	Paeahu	2-1-08: 115	Inventory Survey of the Wailea One Parcel (23.195 acres): The wall (50-50-14-4791) was assigned a site number.
60	Rosendahl, P.	1981a, b, c	Paeahu	2-1-08: 42 por.	Reconnaissance Survey: in the area between Okolani and Kapili Streets
61	Klieger et al.	1992	Paeahu	2-1-08: 42 por.	Data Recovery Wailea Resort Parcel SF-7 (13.27 ac.): Two sites (50-50-14-2867-2868) tested (3 C-shapes and 3 modified outcrops) at 240 ft amsl. Only basalt and volcanic glass flakes and some polishing stones were recovered. The C-shapes were interpreted as WWII structures. Only modern dates were returned.
62	Landrum & Cleghorn	1989	Palauca, Paeahu	2-1-08: 42 por.	Reconnaissance Survey of Parcels SF-7 and SF-10: 7 sites with 11 surface features were recorded. 14 subsurface features were exposed in backhoe trenches. Two radiocarbon dates of A.D. 1680-1860 and 1520-1620 were determined.
63	Stocker et al.	1992	Paeahu	2-1-08: 42 por.	Inventory Survey of Parcel MF-12: One site (50-50-14-3114) with four features was recorded. Test pits and backhoe excavations were conducted. No subsurface features were found.
64	Gosser et al.	1993	Palauca, Waipao	2-1-08: 42 por.	Data Recovery: in the Southern Acreage and Lot 15
65	Gosser et al.	1995	Paeahu	2-1-08: 42 por.	Inventory Survey: Parcel MF-11
66	Roe & Cleghorn	1990	Paeahu	2-1-08: 42 por.	Reconnaissance Survey of a 10.41 acre parcel (MF-11). Two rock shelters were recorded Site 2703, and 14,2702.
67	Sinoto & Pantaleo	2001	Paeahu, Palauca, Keauhou	2-1-08: 56, 71	Inventory Survey of 670 acres of the Wailea 670 Parcel : Resurvey of densely vegetated areas; four previously unrecorded sites (50-50-14-5109-5112) were found, one in the north section and three in the south section; little cultural material was found during testing.

Study #.	Author	Year	Ahupua'a	TMK	Results
68	Walton	1972	Palauea, Papaanui, Keauehou	2-1-08: 56, 71	Reconnaissance Survey of the Pi'ilani Hwy extension through the Wailea 670 Project Area: Recorded seven sites (201-205, 211) in 670 project area including walls and structural complexes; road corridor 3.2 to 4.8 m inland in barren zone. In all, recorded 12 sites (201-212) with 19 features.
69	Kennedy	1988	Paeahu, Palauea, Keauehou	2-1-08: 56, 71	Reconnaissance Survey of the Pi'ilani Hwy extension through the Wailea 670 Parcel: The seven sites first recorded by Walton were not relocated.
70	Hammatt	1979	Paeahu, Palauea	2-1-08: 56- 71	Reconnaissance Survey of the Wailea 670 Parcel (700 Acres) in the coastal and lower barren zone. The seven sites first recorded by Walton were not relocated.
71	Barrera	1974	Palauea, Paeahu	2-1-08: 92	Reconnaissance Survey of the Wailea Land Co. Southern Acreage: Several Coastal and Lower Barren zone parcels; identified 16 sites with 29 features (50-50-14-2697, 2698, B10-2, B10-4 to 15)
72	Cleghorn	1974	Palauea	2-1-08: 92	Inventory Survey of Wailea Land Co. Southern Acreage: Recorded 13 sites with 88 features in the T-16 area (later consolidated into State sites 50-50-14-2696-2700, 2688)
73	Kirch	1970	Palauea, Keauehou	2-1-08: 92	Data Recovery at the Wailea Land Co. Southern Acreage: Excavation of two pre-contact site complexes. Site 1028 was determined to be a <i>kauhale</i> complex and 1029 a possible <i>mua</i> , or men's house.
74	Kirch	1971	Palauea	2-1-08: 92	Data Recovery at the Wailea Land Co. Southern Acreage: published report of the 1970 excavation at sites 1028 to 1029. One habitation feature dated to A.D. 1545-1745 at Palauea Landing Site 50-50-14-1028.

Study #.	Author	Year	Ahupua'a	TMK	Results
75	Toenjes et al.	1992	Palauea	2-1-08: 71	Inventory Survey of the Murray Pacific Project (57 acres): Conducted intensive recording and testing at 20 (232-235, 237-238, 240, 260-261, 1027-1030, 2860-2866) previously recorded sites. Four sites were dated - Site 235, two C-shapes, returned a modern date; Site 2680, an historic midden returned a post-contact date; Site 2862, a midden, returned a pre-contact date; and Site 260, a habitation/ possible <i>heiau</i> returned two dates indicating a long occupation, possibly as early as A.D. 1161; Site 235 (modern); Site 260 (A.D. 1522-1955; A.D. 1161-1625); Site 2860 (A.D. 1669-1946; Site 2862 (A.D. 1453-1955)
76	Sinoto & Pantaleo	2000	Palauea, Keauhou	2-1-08: 56 por.	Inventory Survey of the southern portion of the Wailea 670 Parcel (190 acres): 24 sites (200, 200a, 201, 204, 205, 3156-3158, 4945-4961) with 40 features were found in this rough aa land. The majority were temporary habitation features associated with <i>mauka-makai</i> trails; little cultural material was found in the test units
77	Toenjes et al.	2000	Palauea	2-1-08: 71	Inventory Survey: Supplementary Work at the Murray Pacific Project. 16 sites (232, 233, 235, 238, 240, 260-261-1072-1029, 2860-2866, 4792) with 255 features were recorded. The age of the sites dated to A.D. 1300s to A.D. 1878.
78	Haun	1987b	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Assessment of a Murray Pacific Parcel (60 acres): located 9 previously unrecorded sites.
79	Shapiro & Haun	1989	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Reconnaissance Survey: Murray Pacific Parcel - Relocated 11 previously identified sites (State sites 232-235, 238, 240, 260-261, 1027-1029) and recorded 8 new sites (no state site numbers assigned). Augering of the sand dunes produced no results.
80	Sinoto & Pantaleo	1993	Keauhou	2-1-08: 71	Inventory Survey of the Wailea 670 Parcel Southern Boundary: A C-shape and two walls (50-50-14-3156 and 3157) were recorded. The C-shape was tested but there were no cultural remains. The features were identified as possible temporary habitation or agricultural features.

Study #.	Author	Year	Ahupua'a	TMK	Results
81	Gosser et al.	1997	Keauhou, Kalihi, Waipao, Papaanui	2-1-08: 92 por.	Data Recovery in Parcels III and IV of the Seibu Lands
82	Bordner & Cox	1982	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of Seibu Lands Parcels III and IV: Recorded site complexes in Parcel IV with habitation structure and associated agricultural features on ridges with good visibility and near seasonal water.
83	Clark	1974	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Project Parcels III and IV: 8 sites were recorded in Parcel IV, including caves, enclosures, and agricultural terraces (Sites 50-50-14-2243-2250)
84	Clark et al.	1997	Keauhou, Kalihi, Waipao, Papaanui	2-1-08: 92 por.	Data Recovery in Parcels III and IV: 70 sites comprised of 493 features were recorded. 68 radiocarbon dates were determined: the earliest occupation was A.D. 1100 (1 date); 4 dates ranged from 1300 to 1500; 14 dates ranged from A.D. 1450-1700; and, 36 dates ranged from 1700 to present. Sites 50-50-14-2601 and 2602 were in Keauhou; Sites 2592 and 2597 were in Waipao/Papa'anui; 2595, 2587, and Site 2598 was in Papa'anui.
85	Pantaleo & Charvet-Pond	1989	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Lands Parcel III and IV: 75 sites with 301 features (IV 31 sites with 109 features) were recorded. 19 possible burial features were tested and human remains were found in two. Five charcoal samples from five sites ranged from A.D. 1689-1749 to A.D. 1859-1919.
86	Schilt	1988	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Lands Parcels III and IV: 221 sites with 415 features (108 sites with 172 features in Parcel IV)
87	Dang et al.	1993	Keauhou, Kalihi	2-1-08: 92	Monitoring Report on Wailea Resort Parcels MF-23, MF-22, SF-12, SF-13, and MF-20: Midden was noted in the vicinity of Site 50-50-14-2693, a probably <i>kauhale</i>

Study #.	Author	Year	Ahupua'a	TMK	Results
88	Hammatt & Folk	1979	Paeahu	2-1-08: 62	Assessment: No surface features were noted. Much of the area had been bulldozed.
89	Walker, A., & Haun	1987	Paeahu	2-1-08: 62	Reconnaissance Survey of the Grand Champions Resort (10.6 acres): One exposed cultural deposit (1794) was recorded and tested with augers. The deposit was 1.0 m in depth.
90	Folk & Hammatt	1992	Paeahu	2-1-08: 62	Assessment: No surface sites were found; much of the property had been bulldozed and graded.
91	Fredericksen, E.	1998	Paeahu	2-1-08: 103	Assessment: 4 acres-no remains.
92	Spear	2000	Paeahu	2-1-08: 103, 121	Inventory Survey: Area (17.89 acre parcel at 160-300 ft elevation) was found to be extensively modified. No surface features were found.
93	Rotunno-Hazuka & Pantaleo	1994	Paeahu	2-1-08: 74-75 por.	Inventory Survey: 15.2-acre parcel; no surface features were found. The parcel had been previously graded.
94	Gosser	1990	Paeahu	2-1-08: 42 por.	Data Recovery at Parcel SF-10: Two mounds were found and tested - probably agricultural.
95	Spear	1987	Paeahu	2-1-08: 40, 59	Inventory Survey: Five habitation sites with 13 features were recorded. Auger testing was conducted in the sand dune. A burial was found in one tested platform at Site 50-50-14-2013. Detailed recording and test excavation were conducted at sites B-1-9, and newly identified sites T-1 and T-4 (50-50-14-2011-2014). B12-6 was destroyed (sites first id by Rosendahl 86)
96	Schilt & Dobyns	1980	Paeahu	2-1-08: 40, 59, 86, 87, 89	Reconnaissance Survey: 33 structures and one petroglyph were recorded. A volcanic rind date of A.D. 1704-1740 was determined for one feature.
97	Shun & Streck	1981	Paeahu	2-1-08: 78, 87, 86, 40, 89, 59	Data Recovery and Monitoring: 50-50-14-1281 and 1384, two habitation complexes, were tested. A C14 sample for one site was A.D. 1615-1845.

Study #.	Author	Year	Ahupua'a	TMK	Results
98	Bordner	1980	Palauea	2-1-08: 92 por.	Reconnaissance Survey: Excavations in Fea. 12 and 13 of Site 50-50-14-1028, two C-shapes. They were interpreted as temporary habitations, dating to A.D. 1720-1752 (volcanic rind date). This project was an extension of Davis & Bordner 1977a, b.
99	Haun	1987a	Palauea	2-1-08: 87	Assessment of Embassy Suites Hotel site: Sites 50-50-14-2017 (residential complex) and 2018 identified
100	Dicks & Haun	1987	Palauea	2-1-08:87	Inventory Survey of the Embassy Suites Hotel Site: Testing at Site 50-50-14-2017, a residential complex and 2018, an historic ranch wall. Augering testing of the sand dune was conducted and a cultural layer was noted. A volcanic rind date of post-1600 was determined.
101	EISC	1989	Palauea	2-1-08: 93	Data Recovery: at Site 50-50-14-1028. The excavation of C-shapes indicated that the density of cultural material was found at the entrances and outside the features rather than inside.
102	Fredericksen, E., & D. Fredericksen	2000	Palauea, Keauhou	2-1-23: 01	Inventory Survey: Parcel MF-21 - Ten sites (State Sites 50-50-14-4804 to 4813) were recorded in a 23-acre parcel. They consisted of a ceremonial site (4804), 3 rock shelters, 1 coral scatter, and 5 walls.
103	Cleghorn	1975a, b	Waipao	2-1-08: 92 por.	Data Recovery: Site 50-Ma-B10-1 consisted of one enclosure, one mound, and three alignments. 16 sq m of the site was excavated. Two volcanic rind dates were 1807-1871 and 1669-1735, indicated the site was occupied in the late pre-contact/early historic period.
104	Gosser & Cleghorn	1990	Keauhou, Kalihi, Waipao, Papa'anui	2-1-08: 92	Reconnaissance Survey of the Wailea Land Co. Southern Acreage

Study #.	Author	Year	Ahupua'a	TMK	Results
105	Davis & Bordner	1977b	Palauea, Papaanui, Keauhau, Waipao	--	Reconnaissance Survey of Road Corridor in Coastal Zone: Together with the above, they recorded nine sites in Palauea and 6 sites in Papa'anui. The sites formed a coastal settlement in association with a possible <i>heiau</i> (Palauea sites 232, 233, 235, 238, 240, 261, 260, and 261, 1028, 1029) [Map has sites 240, 260, 261, 1038 and 1030 in Palauea; 262, 1361-1362, B10-19 in Keauhau; 245 and B10-3 in Kalihi; B10-1 in and 197 in Waipao; none in Papa'anui; 196 and 1266 in Ke'eo]
106	Sinoto	1981	Papa'anui and Waipao	2-1-08: 92 por.	Reconnaissance Survey of the Seibu Project area: 14 sites were recorded. Five were scattered surface middens, representing the remnants of sites that had been bulldozed.
107	Bath	1983	Palauea	2-1-08: 78	Reconnaissance Survey: Eleven sites recorded; four were cattle walls and the rest were pre-contact.
108	Rosendahl, M.	1981a, b	Paeahu	2-1-08: 42 por.	Reconnaissance Survey: in the Grand Wailea Resort- Development Sites 37, 50, 51, 74
109	Rosendahl, M.	1987	Paeahu	2-1-08: 59	Data Recovery at the Grand Wailea Hotel: Site 50-50-14-2012 (single enclosure) and 2013 (6 habitations features) were tested. Traditional and historic artifacts were recovered. Two burials were found at site 2013. Radiocarbon dates ranged from A.D. 1640-1890; 1650-1950, WWII (Site 2012) to the mid 1300s-mid-1600s (Site 2013).
110	Davis & Bordner	1977a	Palauea	--	Reconnaissance Survey of Road Corridor in Coastal Lower Barren Zone: Seven new sites (50-50-14-232, 288, 235, 238, 240, 260 and 261) were recorded, which were part of a coastal settlement.
111	Major <i>et al.</i>	1995	Palauea	2-1-08: 92	Data Recovery: at Site 50-50-14-1028
112	Rogers-Jourdane	1979	Keauhau, Kalihi, Waipao, Papa'anui	2-1-05 thru 08	Reconnaissance Survey of the Wailea Pacific Parcel <i>mauka</i> of the highway. Sites 50-50-14-2252-2258, 2260, 2262-2270, and 2272 were recorded.

Study #.	Author	Year	Ahupua'a	TMK	Results
113	Rosendahl, P.	1984	Paeahu	2-1-08: 86	Assessment: Sites 4, 10, 12-13, and 14 were relocated (Rogers-Jourdane 1979). Traditional and historic artifacts were found. Site 12/13 was a temporary habitation structure with little cultural material.
114	Rosendahl, P., & Walker	1984	Paeahu	2-1-08: 86	Inventory Survey: Test Excavations at the Wailea Point Condominium area
115	Walker, A., <i>et al.</i>	1985	Paeahu	2-1-08: 86	Inventory Survey of Wailea Point Condominiums: Backhoe trenching was conducted in a sand dune. There was no cultural deposit.
116	Rogers-Jourdane	1979	Paeahu	2-1-08: 92 pot.	Reconnaissance Survey: Seven features were recorded, including a C and a U-shaped enclosure. Site 50-50-14-1281, the Wailea Complex, was also relocated.

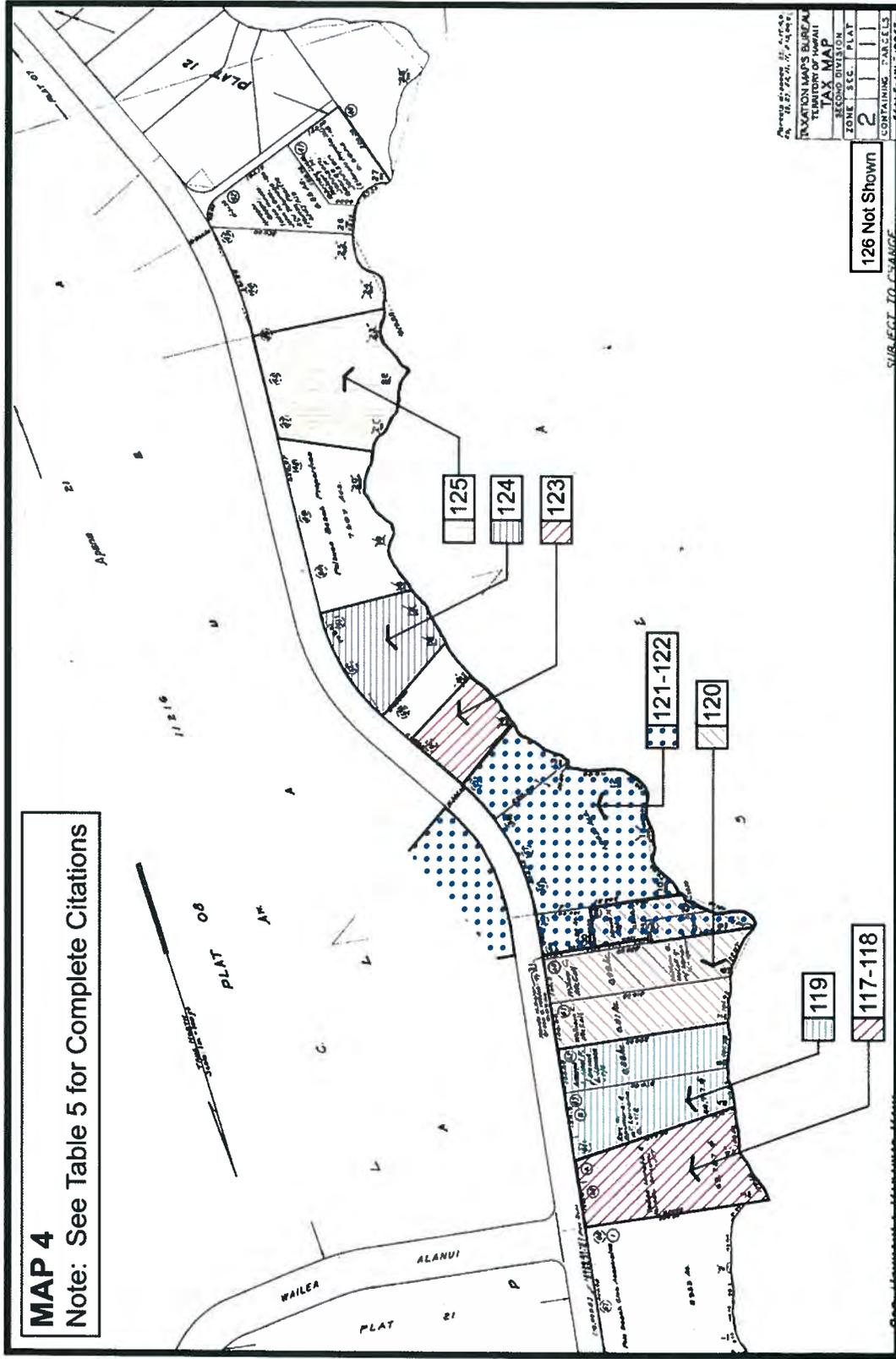


Figure 8. MAP 4 Coastal Paeahu to Keauhou (Tax Map Key 2-1-11, 12), Showing the Location of Previous Archaeological Studies in the Vicinity of the Project Corridor.

Table 5 Previous Archaeological Studies Depicted on MAP 4 (Figure 9)

Study #.	Author	Year	Ahupua'a	TMK	Results
117	Henry et al.	1992	Palauea	2-1-11: 03	Data Recovery: Additional testing (augers and backhoe trenches) at the Makena Beach lots (1.6 acres) where Donham (1990b) found two infant burials (Site 50-50-14-2496). Subsurface cultural deposits were found, but no additional burials were uncovered.
118	Donham	1990b	Palauea	2-1-11: 03	Inventory Survey of the Makena Beach Lots (1.6 acres): One site complex (50-50-14-2496) with six features was recorded. Two infant burials were found. Three radiocarbon dates were determined: A.D. 680-1020; 1440-1670; and, 1280-1470. All three dates were from the same pit.
119	Rotunno-Hazuka & Cleghorn	1990	Palauea	2-1-11: 05, 06	Inventory Survey: Supplement report to Landrum and Cleghorn 1989 - Hand excavated trenches in parcels 5 and 6. Pre-contact and historic deposits were uncovered, dating to A. D. 1490-1590 and A.D. 1780-1880 (C14 dating).
120	Cleghorn & Landrum	1989	Palauea	2-1-11: 07, 08, 09, 29, 31	Phase I Survey:
121	Haun	1987b	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Assessment of the Murray Pacific Parcel (60 acres): Same project area as Kirch 1969; located 9 previously unrecorded sites.
122	Shapiro & Haun	1989	Palauea	2-1-23: 02; 2-1-11: 09, 12, 13, 30	Reconnaissance Survey: Relocated 11 previously identified sites (State sites 232-235, 238, 240, 260-261, 1027-1029) and recorded 8 new sites (no state site numbers assigned). Augering of the sand dunes produced no results.
123	Sinoto et al.	2002	Palauea	2-1-11: 14	Inventory Survey: Nine backhoe trenches were excavated in this 0.52-acre coastal parcel. A cultural deposit (designated State Site 50-50-14-5194) with two hearth features was recorded.
124	Haun & Henry	2002	Palauea	2-1-11: 16-17	Inventory Survey: No surface features were noted. 21 backhoe trenches were excavated. A cultural deposit with two human burials, designated State Site 50-50-14-5200, was found during subsurface testing.

Study #.	Author	Year	Ahupua'a	TMK	Results
125	Haun & Henry	2001b	Palauea	2-1-11: 21, 22, and 23	Inventory Survey: Two sites were recorded. Site 50-50-14-5104 (stratified cultural deposit) was dated to A.D. 1660-1950 and Site 5120 is an historic road, probably dating to WWII.
126	Kirch	1969	Paeahu, Palauea, Keauhau, Papaanui	--	Reconnaissance Survey of the Wailea Resort: Documents a coastal settlement and settlement patterns. Recorded 11 sites, which were later consolidated into 8 State Sites (50-50-14-197, 1027, 1281, 1351-1353, 1362, and 1358). Site 1362 is a possible <i>heiau</i> .

Table 6 Previous Archaeological Studies Depicted on Map 5 (Figure 10)

Study #	Author	Year	Ahupua'a	TMK	Results
127	Dega	2000	Kalihi	2-1-07: 72	Inventory Survey: Five features were recorded and two were tested; one wall, one terrace and 3 rock mounds (later determined to be bulldozer push piles). The first two features were incorporated into the previous identified 50-50-14-4818, a pre-contact habitation site first identified by Roberts <i>et al.</i> 2000.
128	Lee-Grieg	2002	Keauhou, Kalihi	2-1-07: 08, Lot A-1	Inventory Survey: 3.19-acre parcel; two walls (Site 50-50-14-4818) and one fence line were identified. Three backhoe trenches, eight shovel tests, and seven test units were excavated. One cultural deposit was identified and one burial was encountered.
132	Fredericksen, E., & D. Fredericksen	1998d	Papa'anui (Waipao)	2-1-07: 71	Inventory Survey: Three previously unrecorded sites were located (50-50-14-4504, 4505, and 4506), a post-contact enclosure, a rock overhang, and a pre-contact habitation. Site 4505 enclosure was possibly one of the seven school houses built in the early 19th century.
133	Cordero & Dega	2001	Papa'anui (Waipao)	2-1-07: 12, Lot B	Data Recovery: 6-acre parcel: Six sites located (50-50-14-3513 to 3518) with 25 features. Three radiocarbon dates were determined: A.D. 1680-1940, 1630-1910; 1280-1460. Site 3513 was a permanent habitation site. Testing was also conducted at Sites 3513, 3514, and 3516.
134	Chaffee & Spear	1994	Papa'anui (Waipao)	2-1-07: 12, Lot B	Inventory Survey: Six sites (50-14-3513 to 3518) with 25 features were recorded in a 6-acre parcel. Wood charcoal from a modified outcrop was dated to A.D. 1660-1950.
135	Roberts et al.	2000	Kalihi	2-1-07: 102, 8 por.	Inventory Survey: One site, 50-50-14-4818, was identified. It was a temporary habitation in the proto-historic period with an historic wall component. Two C14 dates were determined; one modern and one AD 1800-1940.
136	Clark	1988	Papa'anui	2-1-07: 95	Data Recovery: Report on additional burials found at this site. 50-50-14-1830.

Study #	Author	Year	Ahupua'a	TMK	Results
129	Sinoto & Rogers-Jourdane	1979	Keaouhou, Kalihi, Waipao, Papaanui	2-1-07: 36, 79, 81	Reconnaissance Survey of Makena Surf Parcel (17 acres): Test Excavations at 13 sites (no state site numbers) previously recorded by Sinoto (1978a). Volcanic rind dating was used to determine that two sites dated to the pre-contact period and all other sites were within the early historic period from A.D. 1750-1800
130	Sinoto	1978a	Keaouhou, Papaanui, Kalihi, Waipao	2-1-07: 36, 79, 81	Reconnaissance Survey on the Makena [Surf] Shores Parcel (17 acres): Eighteen features were recorded but were not given State site numbers. They included coastal habitation features, including a canoe shed, and an historic cemetery.
131	Dobyns	1988	Papa'anui, Kalihi, Waipao, Keaouhou	2-1-07: 36, 79, 81	Data Recovery on the Makena Surf Parcel (17 acres): Test Excavations at seven sites (no state site numbers); Volcanic rind analysis produced dates that ranged from A.D. 1601-1812. Recovered artifacts also suggested later pre-contact and/or early historic occupation for most of the sites.
137	Fredericksen, E., & D. Fredericksen	1998b	Papa'anui	2-1-07: 79, Lot 1-A	Inventory Survey: One previously unrecorded site, 50-50-14-4544, consisted of a habitation and activity area, a rock shelter, and a pavement of waterworn pebbles and coral refuse pit. The shelter had artifacts, tattoo needles, tools, and midden. Ornaments, shark teeth, and volcanic glass flakes were found on the pavement.
138	Jourdane	1988	Papa'anui	2-1-07: 79	Monitoring Report: at Sites 50-50-14-1817 to 1819. A backhoe trench was excavated. No cultural deposit was found. Eight bait cups were found on the coastal point west of these sites and north of Nahuna point.
139	Fredericksen, E., & D. Fredericksen	1998c	Papa'anui	2-1-07: 07, 98	Inventory Survey: 4 sites found (50-50-14-4524-4527) were recorded. Site 4524 is possibly the Nanahu Ko'a, first recorded by Walker 1931. Other sites were an overhang and historic walls
140	Tome & Dega	2001	Papa'anui (Waipao)	2-1-07: 87	Inventory Survey: One Site (50-50-14-5123) was identified, consisting or an alignment and a rock-filled terrace. The site was interpreted as a pre-contact/early historic temporary habitation.

Study #	Author	Year	Ahupua'a	TMK	Results
141	Tome & Dega	2002b	Papa'anui (Waipao)	2-1-07: 87	Monitoring Report at site 50-50-14-5123, which had been previously tested and found to contain pre-contact lithics, charcoal and shell midden. During monitoring, an historical deposit with many historic artifacts was also uncovered.. The majority of the artifacts dated to the 1940s, when the military occupied the area.
142	Fredericksen, E., & D. Fredericksen	1998a	Papa'anui	2-1-07: 99	Inventory Survey: 4 sites recorded and tested: a WWII concrete base for a cannon (50-50-14-4673), an overhang shelter (4674), a site remnant (4675), and a rock shelter (4676).

Similarly, the archaeological inventory surveys of Hammatt and Shideler (2000) and Kikiloi et al. (2000) found no historic properties within a combined area of approximately 20-30 acres. These two parcels are located within a kilometer and a half of the current project area, which is to the north, at approximately the same elevation and distance from the coast. These parcels will likely have very similar topographic and vegetation conditions as the current project area. Watanabe (1987), in a reconnaissance survey immediately inland (at the 280-350' elevation) of the current project area, also found no historic properties.

Chaffee et al. (1997) identified three historic properties that were interpreted as agricultural features. Donham (1989, 1990) identified 16 sites, including nine terraces, seven enclosures, four C-shapes, four rock piles, two platforms, an alignment, and a modified outcrop. Most features were interpreted as agricultural features, although a few are considered temporary habitations. The conclusions state that these agricultural and habitation features indicate a more extensive use of the "transitional" or barren zone than some settlement models suggested. Donham's (1989, 1990) work took place within a portion of Miura's (Bordner and Cox) (1982) project boundaries and found similar archaeological features.

In a field report included in Walker's *Archaeology of Maui* (1931), Bruce et al. (1972) report on findings related to an archaeological study in the Kanaio area. The purpose of this study was to locate and photograph Walker Sites 188-192. The following is a description made of the Kanaio project area:

The land at Kanaio, in the vicinity of the Congregational Church, is exceedingly rocky. Stone walls are everywhere. It appears that there area many unrecorded sites in the area. (Bruce et al. 1972 in Walker 1931)

The only identified site in the vicinity of the current project corridor was a platform tentatively identified as Walker Site 189, Kohala Heiau (Figure x). The location of the site is described as:

On the inside turn in the road, looking mauka, South of the Kula Pipeline and at the South corner of the eucalyptus grove – where the road turns and runs on a lateral between the eucalyptus grove and the reservoir. (Bruce et al. 1972 in Walker 1931)

The Kohala Heiau (Walker Site 189) is described as:

A rough platform of basalt blocks on the end of a high ridge overlooking the sea. Its greatest length is 53 feet and width 34. The front has been built up into a terrace 3 feet high extending for 23 feet. But the stone pavement only extends 8 feet back, the remainder is the natural hill level. The western side is also stone faced but there are not true walls. No coral or pebbles were seen. The hill extends for some distance level in front of the platform and some of the open space may have been included in the heiau confines. (Walker 1931:259)

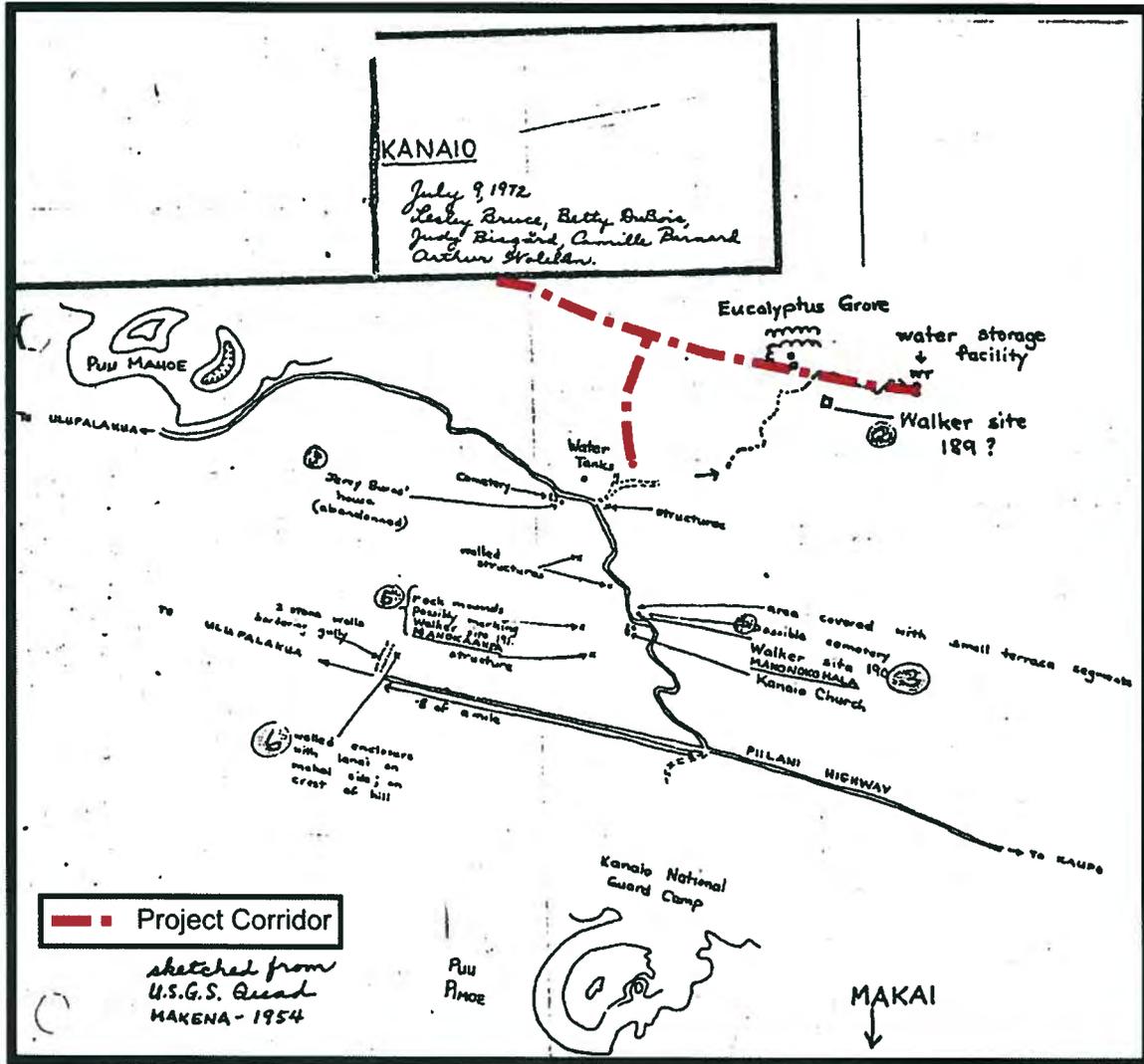


Figure 10. Sketch, adapted from a field report by Bruce et al. (1972) on findings from an archaeological study in the Kanaio area included in Walker's *Archaeology of Maui* (1931) (present project area shown)

IV. RESULTS OF COMMUNITY CONSULTATION

The following table presents the results of the community consultations that were conducted with columns for name, affiliation, contact information, knowledge of the area and comments.

Table 7. Preliminary Results of Community Consultations

Key:

Y=Yes

N=No

A=Attempted (at least 3 attempts were made to contact individual, with no response)

S=Some knowledge of project area

D=Declined to comment

U=Unable to contact, i.e., no phone or forwarding address, phone number unknown

Name	Affiliation	Contacted	Personal Knowledge (Y/N/S)	Comments
Mrs. Alice Alo (Po)	Former resident of Kanaio.	Y	Y	Interviewed February 16, 2004.
Mr. Clarence Alo	Former resident of Kanaio	Y	Y	Interviewed February 16, 2004.
Hana Community Association		A		
Mr. Leslie Kuloloio	Hui Alanui O Makena	A	S	None
Mr. K. Ki'ili	Royal Order of Kamehameha I, Chapter IV Heiau O Kahikili (Maui)	U		
Thelma Shimaoka	Office of Hawaiian Affairs	Y		Made referrals.
Ms. Vanessa Medeiros	Department of Hawaiian Homelands	Y		Made referral to Mr. Artates.
Mr. Perry Artates	Waiohuli Hawaiian Homestead Association President.	Y	Y	Interviewed November 14, 2003.
Mr. and Mrs. Edward Hew	Residents of Kēōkea	Y	Y	Interviewed November 14, 2003.
Mr. Richard Dancil	Resident of Kēōkea	Y	Y	Interviewed November 14, 2003.
Mr. Jeremy Wong	Resident of Waiohuli Hawaiian Homestead	Y	Y	Interviewed November 14, 2003.

Results of Community Consultations

Name	Affiliation	Contacted	Personal Knowledge (Y/N/S)	Comments
	Maui County Cultural Resources Commission	Y	S	Made Referrals.
Mr. Nathan Napoka	State Historic Preservation, Culture and History Department	Y	Y	Gave extensive information on Palauea Ahupua'a and Kula/Honua'ula area. Made referrals.
Mr. Keoki Sousa	Kahuna La'au Lapa'au o Maui	U		
Ms. Natalie Kama	Kēōkea Hawaiian Homes Farmers Association	U		
Mr. Charles Maxwell	Chair, Maui/Lāna'i Island Burial Council	Y	Y	Commented on burials in Kanaio area.
Mr. Patrick Matsui	Department of Parks and Recreation	Y	S	No concerns.
Mrs. Nancy Purdy (DeLima)	Resident of 'Ulupalakua	Y	Y	Interviewed February 2, 2004.
Mr. Daniel Purdy	Resident of 'Ulupalaka, <i>paniolo</i> retired 'Ulupalakua Ranch	Y	Y	Present at interview with Mrs. Purdy.
Ms. Carol-Marie Lee (DeLima)	Former resident of Mākena, Kaho'olawe Island Reserve Commission	Y	Y	Present at interview with Mrs. Purdy.
Mr. Bill Eby	Resident of Ha'iku, <i>paniolo</i> .	Y	Y	Interviewed January 30, 2003.
Mr. Otani	Resident of 'Ōma'opio, farmer and <i>paniolo</i> .	Y	Y	Interviewed January 30, 2003.
Ms. Sharon Jean	Alu Like, Inc. Ke Ola Pono No Na Kupuna Project (KOPP)	A		

A. The Interview Process

Interviews for the Kēōkea portion of the waterline were conducted on November 14, 2003 with Mr. Ed Hew and Mrs. Blanche Hew, Mr. Jeremy Wong, Mr. Richard Dancil, and Mr. Perry Artates. The taped interview lasted approximately one and a half hours (See Appendix B). All five participants were then given the opportunity to review the transcriptions and provide any

necessary corrections and/or editing remarks to approve the final transcription. An “Authorization for Release” form giving permission for the interviews to be used as part of this assessment was then signed by all of the individuals interviewed (See Appendix A).

Interviews for the ‘Ulupalakua portion of the waterline were conducted on January 30, 2004 and February 2, 2004. On January 30, 2004, Mr. Sadao Otani, Mr. Bill Ibi, and Mr. Bill Uemura were interviewed at the home of Mr. Uemura in Omaopio (See Appendix C). The taped interview lasted approximately two hours. On February 2, 2004, Mrs. Nancy Purdy, Mr. Daniel Purdy, and Ms. Carol-Marie Lee were interviewed at the home of Mr. and Mrs. Purdy at their ‘Ulupalakua home (See Appendix D). The taped interview lasted approximately three hours. All participants were given the opportunity to review the transcriptions and provide any necessary corrections and/or editing remarks to approve the final transcription. An “Authorization for Release” form giving permission for the interviews to be used as part of this assessment was then signed by all of the individuals interviewed (See Appendix A).

B. Synopsis of Oral Interviews

Following is a brief biographical sketch of each person interviewed together with a short interview synopsis. The synopses incorporate excerpts from the interviews and highlight key points of the interview with special attention to cultural practices and historic changes.

1. *Mr. Edward Hew and Mrs. Blanche Hew (Pang) (Husband and Wife); Mr. Perry Artates; Mr. Richard Dancil; Mr. Jeremy Wong*

Mr. and Mrs. Hew, Mr. Artates, Mr. Dancil, and Mr. Wong, long-time residents of Kēōkea, were gracious to consent to and arrange their schedules to participate in a group interview. The interview took place at Kēōkea Park on November 14, 2003.

i. *Biographical Sketches*

Mr. Edward Hew was born in 1928 and raised in Kēōkea’s Chinatown area. The son of a Hawaiian mother and first generation Chinese father, he grew up playing and hunting in the upland areas of Kula and Honua‘ula, in addition to fishing the coastline from Kīhei to Kahikinui. He attended Kēōkea School until 1940, after which he worked for Haleakalā, Rice, and ‘Ulupalakua Ranches as a cowboy. Mr. Hew briefly lived and worked at Pearl Harbor and in private construction on O‘ahu. He is currently in retirement and resides in the area previously know as Chinatown with his wife Mrs. Blanche Hew.

Mrs. Blanche Hew was born and raised in Kēōkea’s Chinatown area. The daughter of a Polish/Russian mother and second generation Chinese father, she grew up learning the traditions of all three cultures, as well as, the Hawaiian culture that she lived amongst. Mrs. Hew attended Kēōkea School until 1940 and moved on to Maui High School to finish her secondary education. After graduation she lived on the mainland for a few years and returned to the Kēōkea area to work in Pukalani and as a Dietitian at the Kula Sanitarium. She is currently in retirement and active with volunteer groups associated with the Kula Sanitarium and the AARP.

Mr. Perry Artates was born on Maui and raised in Kēōkea near Fong’s Store. He attended Kēōkea School until it closed its doors, and then moved with his family to Pukalani. He currently works for Hawaii Operating Engineers Industry Stabilization Fund and is the President of the Waiohuli Hawaiian Homestead Association. Active in preservation of cultural resources on the

Waiohuli Hawaiian Homestead, he and his family follow traditional Hawaiian values as closely as one can in today's modern society.

Mr. Richard Dancil was also born on Maui and raised in Kēōkea. He attended Kēōkea School until it closed its doors. He has been working as the head of the maintenance department at Kula Sanitarium since 1980. Mr. Dancil currently resides in the Kēōkea area with his wife and is active with the arts and crafts fair under the banyan tree in front of the old Lahaina Court House that benefits the *kūpuna* programs of Maui.

Mr. Jeremy Wong is the grandson of Mr. and Mrs. Ed Hew. He was born on Maui and raised in Kēōkea in the same traditions of his grandparents. Mr. Wong worked for 'Ulupalakua Ranch during his high school years and continues to help during round-ups. He is an avid hunter in the upland areas and fisherman in the coastal areas from Kula to Kahikinui. Mr. Wong was recently awarded a homestead lot in Waiohuli and is currently planning to build a home.

ii. ***Interview Synopsis***

In addition to the Native Hawaiian population, the upland areas, from Kēōkea to Paeahu, were also heavily populated with Chinese settlements in late 19th and early 20th century. Agriculture and ranching were the predominant economic activities in the area.

RD: You see this area right here (referring to the aerial map), right down below here, at the cistern we had *Pakē* (Chinese) in there. Uncle Pat mentioned that that's where they used to run the donkeys.

JW: ...used to have *Pakē* people used to populate this whole area right here, this is Corn Land right above this hill where the Blue Helicopter lands, you can see 'em from the road ... this is all...they say this is Corn Land where the guys used to grow vegetables and stuff like that.

PA: But Uncle, by your recollection, the *mauka* side of Kula Sanatorium was mostly Chinese habitation?

EH: Yeah, yeah...all from Kamaole, all the way over to up here (pointing above Keokea Park) olden days.

(W)as mostly Chinese. Had Hawaiians too, but I didn't know too many of the Hawaiians. But when I was growing up, I know Chinese. I know some Hawaiians, but not as many as Chinese.

CSH: Between, after the Kamaole Tank (going toward Ulupalakua)?

RD and JW: Yeah.

CSH: Yeah. So right between this Paeahu lateral and the Kama'ole tank, there was a lot of Chinese settlement in there?

EH: That's where they used to live, they used to live over here (referring to area between the Paeahu lateral and the Kamaole tank), but I don't think you can find any graves with the Chinese, because they weren't there long enough. They were all in here, but like I said could have been Hawaiians yeah? (The structures)

BH: All the way up the mountain, mostly up the mountain.

CSH: And what were they doing up here? Farming....

EH: Corn, or what ever, they farm everything.

And with no water (irrigation), everything would grow. Used to rain, olden days, almost every day rain. I used to go to school (Kula School) there I used to live up here, at least two miles from there, our school was right here. Used to walk every day with out shoes, rain and all.

Kamaole ranch now...the Chinese run it before (Sun Yut Sen Ranching Operation). I didn't know that, but I read about it there.

CSH: So the Chinese community, mainly agriculture and ranching...I didn't know they were active in the ranching...

EH: Even me, I didn't know. But they were mostly on farms. Not big farms, but enough for them to make a few bucks I guess. And then they wait until they transport their food and stuff, vegetable, by horse and buggy. I never did see, but that's what I was told.

The Chinese community from Kēōkea to Paeahu has since thinned out with only a few families left. Mr. Hew elaborates on the exodus of the Chinese community.

EH: Most of the Chinese that came here, they make there money and back to Honolulu they go. Send their kids to school.

BH: Mhhmmmm.

EH: So you go up to Kaimuki (Oahu) from 6th Avenue, let's see now...Harden, up to Moanalua yeah and from 6th up to 12th all *Pakē* over there before. Majority.

CSH: So the folks that used to live in that area, the Chinese settlement area, there's nobody that would have any concern? Everybody stay Honolulu already?

EH: I think when they left nobody...then when the ranch came...they took over.

Agricultural terrace remnants and clearing mounds in the Kama'ole and Paeahu sections of the project area were located during the archaeological assessment (Tulchin, O'Hare, and Hammatt 2004). These structures were likely used during the prehistoric era and up into historic times.

JW: Yeah, so I know from this whole area get kind of good sized stone structures, stuff like that. It so old, and sometimes the grass is so tall, that you can only see them when the cattle go inside. The cattle eat 'em back down and you can tell where everything stay again. But every time I ask dad to tell me...used to have *Pakē* people used to populate this whole ... (a)ll the stuff is old mossy rocks, the kind old Hawaiian style stuff, could be they (the Chinese settlers) just had move in and the stuff was there already. The only one that I see one big one, can see down inside that's the only one get mossy rock walls and can see the platform. The rest is all this authentic, this old kind.

CSH: Yeah we found some like old rock walls coming up on some of the bedrock, the outcrops and gullies...look like they build up the gully ... then we found couple terraces, this one (referring to a digital photo from the archaeological assessment) is right after the Kula Sanitarium tank.

JW: But I can tell from here, from above the *pu'u* get plenty of this kine small kine piles yeah. We used to think that maybe was grave stones every time, cause over there get little piles of stones but nice yeah. But I don't know what that is, I just look I don't know what it could be but...somebody piled them up.

CSH: Like this? (Showing a photo of a rock mound from the archaeological assessment.)

JW: Yeah like this, all nice like that. But just little piles of them.

BH: Just piles? Or is it like in a square.

Okay, I want to tell you something. You see my grandpa is Chinese, yeah, and you know the land we have up here (near Kula Sanitarium), it's homesteaded by him. And he farmed this land up here, and all the stones that they found, they pile `em up.

CSH: And they make it real nice.

JW: Yeah they pile `em so all the stones stay in one place yeah.

EH: That, it's not grave.

BH and EH: It's not grave.

With regard to burials, the interview participants did not have concerns for traditional Hawaiian or historic Chinese burials in the Kēōkea to Kama'ole region. The concerns for traditional Hawaiian burials were mainly focused around the Kanaio area *makai* of Kula Highway. There was some concern for the discovery of unmarked graves of former TB patients behind Kula Hospital.

EH: ... I don't think you can find any graves with the Chinese, because they weren't there long enough.

But anyway there may be some graves up there from TB time. People who died and no can find the family and they bury them up there.

Although the area of concern for burials and archaeological sites in Kanaio are outside of the current project area, Mr. Hew and Mr. Wong express some concern:

JW: From here on (Ulupalakua toward Kaupo) I see choke stuff, that's where I see the most (Hawaiian sites). Especially in Kanaio, even down in ... I now it's far from the line...but by the big hill like that we know where all the graves and stuff are.

CSH: Down by the training range?

JW: Yeah by the training range, that's why they kind of never like when they were shooting the mountain, because, that mountain. Get caves...that's where I found the cave that I was telling you (Richard) was like right around here. But nobody knows.

EH: I think you stay up here, it's safe...but Kanaio, when you go down, I think...but up here is alright. Down here you find graves...

CSH: Down on the *makai* of the road?

EH: You know where Hawaiian Homes stay.

2. *Mr. Bill Eby and Mr. Sadao Otani*

Mr. Eby and Mr. Otani are longtime residents of the Upcountry area of Maui. Both men spent their youth riding, ranching, and farming; as well as, helping out at Haleakala, 'Ulupalakua, and Kanaolu Ranches during the general round up and branding season. Mr. Eby and Mr. Otani graciously consented to a taped interview at the home of Mr. Otani's son-in-law, Bill Uemura, on January 30, 2004 in Oma'opio, Kula (Appendix C).

i. *Biographical Sketches*

Mr. Bill Eby was born and raised in Hamakuapoko on the Island of Maui. Like Mr. Otani, Bill Eby also assisted the various ranches during round-up and branding season, including Kaho'olawe Ranch. He was an employee of Kaupō Ranch for just one year until going into business for himself. Mr. Eby currently owns a small ranching operation with grazing areas in Pulehu and 'Omaopio.

Mr. Otani was born in the *ahupua'a* of 'Omaopio in 1912. He was raised in 'Omaopio and Waihou farming the land, helping the various ranches in the area during round-up and branding season, and chasing the wild horse herds on top of Haleakalā. When Mr. Otani was in his early twenties, he moved out to Pu'u Mahoe with his bride after receiving a three-year lease from Von Tempskey for clearing large areas of *pamakani*. At Pu'u Mahoe he grew head cabbage and various other seasonal vegetables until he returned to 'Omaopio to care for his ailing father a few years later. Mr. Otani's love of horses and knowledge of the land has carried through to his children, who currently farm the area of 'Omaopio, and his grandson, who has won a few rodeo events himself.

Though both men contend that their knowledge of Native Hawaiian traditions is scarce, their life experiences in the region and knowledge of historical ranch and agricultural practices make them valuable interviewees.

ii. *Interview Synopsis*

In addition to a small Native Hawaiian population, the upland areas, from Kalihi to Kanaio, experienced a considerable Japanese settlement in late 19th and early 20th century. Agriculture and ranching were the predominant economic activities in the area. Mr. Otani and Mr. Eby recall how the mountain side was covered in a plant known as *pamakani*. The plant was originally brought to Maui during the 18th century for cattle feed. Proven to be a very invasive species as well as bad for livestock in large quantities, ranch owners exchanged short-term agricultural leases for land clearing.

SO: Mr. Von Tempsky, he was a good friend of our family, I was young boy yet. He told us go clean that *pamakani* ... used to be a vine. But...that thing used to kill all the horses from the ranches yeah?

CSH: How come?

BE: The fuzz from the flower, they used to breath it and it would get in the lungs. Killed a lot of horses. But that bug (that feeds on the leaves of the *pamakani* plant) sure cleaned up the *pamakani*.

CSH: So you helped to clean that *pamakani* up there?

SO: Yeah, we used to go clean that *pamakani* they give you a lease for, they lease you the land for three years with the understanding that you clean as much as you want. So we started from there, then, ahh...first was Waihou. Then I ended up in Pu'u Mahoe (Kanaio) that big hill on top. Right there back where the radio station was.

CSH: In back by Pu'u Mahoe?

SO: Oh it was a nice place...so I stayed there three years and then from there I came back. I farmed there three years.

Oh but now no more that *pamakani* you can look at the whole hill and ...

BE: The whole mountain was *pamakani*.

BU: That's what he used to say...they had to clear out the Pamakani to farm.

Honua'ula is located on the leeward flank of Haleakalā. As such, the region covered by the *moku* of Honua'ula is fairly arid, thus dictating the types of crops that would be successful in the area. Pu'u Mahoe, however, was located in an area of Honua'ula that received a considerable amount of rain in relation to the surrounding lands. Mr. Otani discusses some of the types of vegetable crops grown at both Waihou and Pu'u Mahoe.

CSH: So when you were farming Pu'u Mahoe, was it all rain water...irrigate, no irrigate?

SO: Back then, we used to irrigate, but not that much compared to what farmers are using now.

CSH: I got to talk to Ed Hew? Do you know him? About Keokea...and he used to say it used to rain a lot back in the day. Was Pu'u Mahoe the same?

SO: Yeah.

BE: Pu'u Mahoe is right on a strip where it rains.

CSH: So Ulupalakua you grew only head cabbage?

SO: No, cabbage. I used to plant all kind of stuff, depend the time of the year in season. Certain stuff you cannot plant with too much rain. Head cabbage is the one thing you can grow year-round.

BE: What did you grow up Waihou? Cabbage too?

SO: Yeah...Waihou depending on the time of the year yeah? The season, when is the most suitable time. Irish potato...

BU: Any corn? Did you folks plant corn?

SO: No...Waihou, the people didn't plant corn.

3. *Mrs. Nancy Purdy (DeLima) and Mr. Daniel Purdy (Husband and Wife) and Ms. Carol-Marie K. Lee (DeLima)*

Mrs. Nancy Purdy, a longtime resident of 'Ulupalakua, consented to a recorded interview on February 2, 2004 at her home in 'Ulupalakua. Also present were her husband, Mr. Daniel Purdy, and niece, Ms. Carol-Marie Lee (Appendix D).

i. ***Biographical Sketches***

The great granddaughter of William Slocum Wilcox and Kalua Makoleokalani, Mrs. Nancy Purdy was born to Francis Wilcox and John DeLima in 1920 and can trace her genealogy to 'Ulupalakua for over 100 years. She was raised on her family land *makai* of the Kula Highway and adjacent to the *makai* route of the 'Ulupalakua water lateral. She grew up in a fairly traditional Hawaiian way with traditional Hawaiian values through working on her family land, exploring the upland areas of Honua'ula on horseback, and learning about traditional Hawaiian medicines. She attended 'Ulupalakua School and completed her education in nursing. She married Mr. Daniel Purdy in 1940, raised her family in 'Ulupalakua, and continued to work as a private nurse until her retirement at age 72. She and her husband currently reside in 'Ulupalakua.

Mr. Daniel Purdy was born in Waimea on the Big Island in 1916 and moved to 'Ulupalakua with his father at the age of five. He grew up riding the upland and coastal areas of Honua'ula also helping the various ranches during round-up and branding season. The son of the world-champion cowboy, Ikua Purdy, he soon followed in his father's footsteps and became a cowboy for 'Ulupalakua Ranch. He retired from the ranch in the 1970's and is still actively riding his horse "Blackie" in the hills of 'Ulupalakua.

Ms. Carol-Marie Lee was born in 1948 at Kula Sanitarium and raised in Mākena. The daughter of a part-Hawaiian mother and Portuguese-Hawaiian father (oldest brother of Mrs. Nancy Purdy), she grew up learning how to gather ocean resources, farm the land, and take care of farm animals. Ms. Lee attended 'Ulupalakua School until it closed in 1956, after which she went to Kihei School until her sixth grade year when she left for Kamehameha Prep School. After graduation from the Kamehameha Schools, Ms. Lee left to pursue her B.A. degree in sociology at the College of Emporia in Kansas. She married SFC Thomas K. Lee of Damon Track, O'ahu after her graduation and left the islands. Ms. Lee returned to Honolulu, Hawai'i in 1977 and ultimately returned home to Maui in 2000. Ms. Lee currently works for the Kaho'olawe Island Reserve Commission as the Commission Assistant.

ii. ***Interview Synopsis***

Mr. and Mrs. Purdy also recall the considerable Japanese settlement of 'Ulupalakua, in addition to a small Native Hawaiian population, along the upland areas, from Kalihi to Kanaio.

Like Mr. Otani and Mr. Eby, both recall how the mountain side was covered in a plant known as *pamakani* and the association of this invasive plant, not only with the settlement of Japanese farmers, but as an economic supplement for other young men of the area.

DP: There used to be plenty Japanese up here too.

CSH: I did a walk through up there ... we saw some rock piles, piled up rocks...you know the man-made kind. Do you know if there were Hawaiians living in the area before?

NP: Oh many Hawaiians yeah? Before the Baldwins yeah a lot of Hawaiians. But you know all rock piles, something like that (pointing to a clearing mound in the pasture). Used to have farmers up there, farmers. They used to live up there and farm the land.

CSH: Hawaiian farmers?

NP: No ... Japanese. And that's why they build those things, you know when you clearing the land, there's a lot of rocks.

CSH: So the cowboys didn't do that?

NP: No. The cowboys make stonewalls! (laughing)

CSH: But plenty Hawaiians before the Baldwins?

NP: Oh yeah, especially Kahikinui side, a lot of Hawaiians ... Kanaio. It was only Hawaiians around there. The Japanese, they just farm, and when they clear the land, they move over here. From here they move down grandma's place and then they move out. You know, the family got older, so they all move out. Actually, when they have the Japanese come, it's only to lease the place to clean the land. You know? To clear up the land then they could use for their pasture, the lease is over, they have to move to another area. That's how the Japanese used to live before ... and they build their house and when they are done, when the lease is over on this space, they have to tear their house down and take all their things together to another place, and rebuild it. The way they build it is where it's easy to take it apart.

CSH: Like a mobile home?

NP: Mhmm. And then, you know it's really interesting when you think about it, because their homes, when they build they have bedrooms and living rooms. But not a kitchen. When they have parties, they take the walls off, and the whole living room and the bedrooms are all a party room ... it's like a hall yeah? And when their party is over and everything, they put the walls back and all the family sleep in their room. And their kitchens were dirt floor, and they build their own stoves, wood stoves yeah? They build their own stove and they cook right on the fire.

CSH: I was talking to Bill Eby...and he said that up here, it used to be covered in *pamakani*. Is that a native plant?

DP: It's all gone, no *pamakani*, I no see nothing, it disappeared.

NP: That's the kind of job they had when they were young, like 12 and 13 years old, Uncle Nick and them, your dad (Carol's), Uncle Frank. Summertime, they used to go and dig all those *pamakani*, clear up the land.

Traditional plant gathering for medicinal purposes is practiced by long-time residents of 'Ulupalakua. Mrs. Purdy recalls where she learned of the specific purposes of each plant and continues to use these remedies into the present.

CSH: Do you know of any plants up there (up the mountain) that Hawaiians used for medicine?

NP: Mhmm. Yeah they have, like the '*ohelo*, *ohia*. I don't know what else they have up there but I know I used the '*ohelo* for tea. That's where they can find it is up in the mountain.

CSH: And you use it for tea?

NP: And also, you know the *lehua*? That too. The *lehua*, and the '*ohelo*, and one more is the *ihi* over here. There's three kinds that we use for kidney, to flush the kidney. Like for instance...the first time we learned about that. The *ohelo* I was using for myself because his father (Uncle Dan's) said. I got sick after Danny (eldest son) was born and I went to the doctor but I couldn't stay in the hospital because I have a baby...so we stayed with grandma. And then his father told uncle to go and get '*ohelo* leaves and boil it and drink for tea and that would clear my kidneys. It did help. And ever since I always used it...you know every now and then I would use it. Cause it's good because it helps me, I figure it helps me...you know maybe up here (tapping the head and laughing). But anyway, I take that. There is also *ti* root for bruises and swelling. Plus we have *māmake* all over the mountain too yeah?

CSH: What was the *māmake* used for ... tea?

NP: For everything, it's for everything yeah?

CML: The *māmake* you cannot take too much but, because your blood pressure goes low.

When asked if there were concerns about any impacts that the waterline improvements may have to the traditional gathering practices, Mrs. Purdy did not believe that the immediate action of improving the waterline would have any adverse effect.

4. Mrs. Alice Alo (Po) and Mr. Clarence Alo

Mrs. Alice Alo, a former resident of Kanaio currently living in Waihe'e consented to a recorded interview on February 16, 2004 at her home in Waihe'e. Also present was her husband, Mr. Clarence Alo (Appendix E).

i. ***Biographical Sketches***

Mrs. Alo was born in 1936 and raised in Kanaio farming the land and fishing the coast of Honua'ula to survive. Eldest daughter of Sam Po, a former Kanaio guide for the Bishop Museum and Elspeth Sterling, she recalls going around the area with her father during his many excursions. After her father's retirement, the family moved from Kanaio to Paukukalo where Mrs. Alo met and married her husband Clarence Alo.

Mr. Alo was born in Wailuku and raised in Kula where he learned much about the cattle ranching industry and gained knowledge about Hawaiian life styles. He worked at Kula Hospital in his youth and met Mrs. Alo while she was living in Paukukalo.

ii. ***Interview Synopsis***

Because Honua'ula is on the leeward side of Haleakala, the environment is very arid. The residents of Kanaio lived in an extremely isolated area and survival was based on traditional Hawaiian ways and knowing how to farm under arid conditions, supplementing with marine resources from the coastal areas, and trade. Because of this marginal environment, few people lived in Kanaio. The families of the area were primarily self-sufficient, needing only a few things from "town." Mr. and Mrs. Alo recall:

CSH: Do you remember if it rained more back in those days?

AA: Not really.

CSH: It was dry.

AA: Yeah. Actually we don't know when it was going to rain

CSH: So Kanaio water was not predictable at all? The rain?

CA: Yeah, I don't think folks lived...very few people lived there

AA: We had hard times. Well, we raised most of our vegetables like that. A little garden that my father planted. A lot of sweet potatoes and pumpkin like that. My father was a baker and the only thing he would buy from the store was flower and sugar. That was the biggest thing he bought from the store. It's no such thing as candy, or ice cream, or bread. They used to have it in big buckets, you know? He used to buy it by the bucket. And then we used to go to the slaughter house, you know when they slaughter cattle. We used to get the tripe from there. You stay at the slaughter house and clean it and then we take it home and my mom and dad cook it. The chickens, we raised our own chickens, we had our own eggs ... we had ducks. But I don't eat the duck and the chicken and the egg because we feed it! We were the ones to feed the chickens and the ducks, and when my dad killed it...I cannot eat it! Because I was the one that used to do it and I couldn't eat that. And my father used to bake bread. Those big barrels with the cover? He used to bake for three homes. The Campbells below, and us, and the 'Uweko'olanis ... we used to give them bread. It was hard, hard life. And my father used to go

fishing ... and he'd come home with fish. He used to take and sell. Most of the time he used to give to his friends in Kula. And he ends up drinking and come home, no more money...they give him food things though. They give him a lot of food things. My father was a heart man, too big hearted. He used to give to his friends in Kula. Instead of selling the fish to get the money, no he would give them the fish. But that was hard life, we had hard life.

They had a lot of sweet potatoes growing and green onion was one of the things, and tomatoes. And they had mango trees grow in their yard and loquats. But the Uweko'olanis, they hardly had garden, the mom used plant just little patches of sweet potato and my dad used to supply them with a lot of things to help them. Even the Campbells. My dad was a midwife you know. When ever they would go have a baby my dad would go help them. All the kids would come up to our place, and when it's already done, cleaned everything all done we would stay by the hill in the front of our yard...and my father would tell the children to go home it's all over with. Same like my mom, when she was to have a child, we would all go down to the Campbells and we would sit by the cistern, you know a *punawai*, and we all sit there and wait `til my mom would have a baby and my dad would clean her all up then he would come in the front and call us to come home. And the same like the 'Uweko'olanis he would go help them... but not all of them.

CSH: So most people were born *in* Kanaio? They didn't go all the way to Kula San?

AA: Yeah.

One of the few modern day Hawaiian stories revolving around a traditional Hawaiian belief that one should respect the *Po'o Kanaka* (a basalt stone shaped like the island of Maui at the end of 'Ulupalakua Town) was recalled by Mrs. Alo.

AA: Oh no. Have you seen that Maui headstone?

CSH: Yeah! *Po'o kanaka* they call that?

AA: I don't know much about that though. That stone, I remember the last incident that happened. It's chipped, if you noticed if you looked at that stone, it's chipped on one side. You ever heard of this man, George Ka'ualalena, maybe mom knows, his daughter is Esther Campbell. Her father, he was a minister for 'Ulupalakua Protestant Church and the Kanaio Church but he used to go to other churches. I don't know what made him do that...he went over there and he hit the rock, that Maui stone. When he did that, he had a home down in Keoneo'io and the house in the back had a church but he used that. People never used that because it was so old but the pews were all in that church, but he had all these nets piled up. He had outside toilet. And my father them were living down in tents in Keoneo'io, he was a fisherman, and when he did that to that rock. My father said they were down in that tent

... that toilet... a big fire cause no roof, only sides. My father said a big fire was coming out from the toilet...so my father them went up thinking maybe he had come and something wrong with the toilet. My father them went up, they walked up to the toilet, you know the toilet seat never moved...only inside. The board never was destroyed, nothing. My father them wondered what the hell is going on? The next day my brother came home and my brother told them, "Oh...you know Tutu Makeka died." I said how you know. Yeah the old man Manuia came to the house the house and told daddy that he died, he had commit suicide in the bedroom. They tried to get in the bedroom and they couldn't. They tried to break the door down to go inside because they could see him from the window. And then that night all us kids stayed home ... oh! We had to crawl under the bed. Our bedroom when we see, there's a big tree by the window ... and there is no wind! That tree was shaking and banging the wall, oh we were all under the bed. So my father said maybe that was the guy telling somebody that he was gone. I don't know that kine stuff, only make us scared, and only three of us home. Oh my god, I never forget that. But he was a good minister. Because at the Kanaio Church, that's where I learned to talk Hawaiian, he was the *kahu*, then when pau church he used to tell me come down and read the bible to me in Hawaiian that's the only way I could learn. So I would go down and I would read to him, and he wants me to make him pancakes. He love pancakes. And when he died, I missed that...reading in Hawaiian. He used to help me with the words. But that's, yeah, bad (when he died). That's why I told my dad, you know dad Hawaiians are funny people, they're scary. He tell me, "It all depends how you look at it." I said well, I wasn't looking for something like that! He said, "Well good thing they never show you there face! It's worse, you would run for life!"

Like most of the residents of the upcountry (Haleakalā) area, Mr. Alo also recalls the invasive *pamakani* plant, in addition to, the predominance of *kiawe* from the Kanaio area to Makena. He also notes how the plants were introduced to the islands by the ranching industry:

CA: You know, what Kanaio was noted for before? When we were small we used to joke about it. I don't know if you know what is *pamakani*?

CSH: I don't know what that is, but I have heard about that this whole month.

CA: *Pamakani* is not a native species. They thought, whoever brought that here, they thought was good for cattle. In a way was alright, but if they eat too much it was no good, they die you know. It didn't affect the cattle as much as horses, if the horse ate too much of that, they wouldn't last long, they die, they get sick and die. So that's the reason they call that *pamakani*, but it was brought here buy the Mexican or Spanish people, that's not a native plant.

CSH: So what does that mean? *Pamakani*?

CA: I don't know really. And then the *lantana*. Before, you go Kanaio, that's all you see, *pamakani* and *lantana*. But now I guess they brought in some

insects to eat and now no more hardly any of that plant there. *Pamakani* used to be the main thing in Kanaio. You hear a lot of people talk about that?

CSH: Yeah!

CA: Even in Kula even part-way down to Makena used to be loaded with *pamakani* and lantana. And that is not a native plant to Hawai'i, it was brought here just like the *kiawe*. You know *kiawe* was brought for feed for the cattle yeah?

CSH: I didn't know that!

CA: Actually that was brought here for feed. You know the beans? The cattle and horses too, they like that! Even the pigs, they like that. I know people from the country, like Makawao, all those ranchers, they used to go Makena to cut *kiawe* for fenceposts. Because the wood, yeah, last long. That's another thing they found out *kiawe* was good for. But you know, in time to come, I think *kiawe* trees are gonna disappear. You take Kihei, all the way going to Makena used to be all *kiawe* trees. Now get all houses, hotels.

Traditional plant gathering for medicinal, culinary, and lei making purposes is practiced by residents of Kanaio. Mrs. Alo recalls the purposes of each plant and flower and their locations:

CSH: What about Native Plants in the area? Were there any Native plants in the area that folks used?

CA: Have *lehua* ... and *kukui*.

AA: Yeah, *lehua* ... that grows in the lava? They have quite a bit of that up there.

CSH: What did folks use the *lehua* for?

AA: Haku lei. My mom used to make. In fact when it comes to May Day, she used to make when we go to school and give to the teachers. 'Til day I still go up back up there.

CSH: So you still go in this area and gather *lehua*? Up high in here, up at the top?

AA: Yeah, *a'ali'i* and *lehua*. The upper road, not the lower road, but the old road. That's where I go up. I'm familiar with that road, that's where all the *lehua* is at yeah? And then, they have *a'ali'i* they have nice one. But my granddaughter, she likes to go on the lower road, you know that new road? She like to go on that road so we keep going until we see *a'ali'i* and we stop pull over and I go pick.

CA: Get some *lehua* up there too...

AA: That's where we go and pick up *lehua*. You know, I tried to bring home (to Waihe'e) some plants, *a'ali'i* plants, I tried but it won't grow. And then *kukui*.

CSH: For medicine?

AA: To put in raw fish, you know *poke*?

CA: *Inamona*.

AA: But you gotta bring it home, to take off the shell outside you dry it. Then you roast it then you crack the shell, and dig out all the meat in side, and then you pound come fine. And when you make *poke* you can use that. But the green fruit, you know the young babies when they are born, after a while they have that white cake on their tongue. Hawaiians say it's air, but actually it's from the milk, it curdles and leaves this massive white on the tongue, that makes the baby uncomfortable, cause can bleed. So they use the green fruit. They tear of the stem and put the juices on there clean the tongue.

(I)t's all in the lava anyway. The *a'ali'i* is so spread out but the *lehua*, my favorite spot is on the upper road, the old road. I like it up there. And my husband told me the first time I took him to pick, "The Hawaiians, I wonder if they allow you to pick them." I said "Eh, before you even pick them, you say something. You don't go out there on the lava flow and just take!" He said, "Oh you know that kind stuff." I said, "My dad told me. You say something first before you harvest" So I guess I did my share because it's all right. Plenty of times, when I was working Waihe'e School they used to have lei contest. I used to go up, I would go up special just to go pick up *lehua* and *a'ali'i* and I come home and make *haku* lei. Everytime I enter, I always win, and I see better kind leis than that. But the principle always ask me, "Where you get all this *lehua* and flowers." I say, "From country, from Kanaio." He says, "Kanaio! You go all the way up there to go get and come back and make lei and enter?" I said, "Yes. Because I don't have this kind in my yard. That's why I go all the way up there and make special." He said, "You know every year you do that, you always win." But I don't make the same colors. Maybe one year is the yellow *lehua* because they got it up there, and they got the pink, and they got the red. The pink you have to walk in far from the road and the red.

With regard to burials within the project area, Mrs. Alo noted one close area that may have burials, however, this location is not within the immediate project area and is surrounded by a grove of eucalyptus trees.

CSH: The eucalyptus tree area (grave locations) that you are talking about...

AA: If you know a beige color house a nice one, it's below of the Po'aipuni's. In fact, on the highway you going. There's a road the National Guard, yeah in the Kanaio area, kept to go down there, there's a road on the left that goes up ... you can see it. The road that goes down to the National Guard you can see that eucalyptus tree up on the left. You gotta look, there's big eucalyptus trees right there. Now I don't know of any pipelines running through there. There's a little house right there close to the road, a little house, right there you look up you can see all that eucalyptus trees and it's right there. You can see it's all rocks, but that's a form of graves too yeah?

CSH: So really nothing up there, burials wise(up by the pipeline).

AA: Not that I know of.

When asked if they believed the current waterline project would have adverse impacts on plant gathering practices, both Mr. and Mrs. Alo did not believe that would be the case.

AA: The times I go, there's nobody. Even on the highway, I don't see anybody picking on the highway. So I don't know. But I know I make use of those things up there.

CA: You know, now when they do anything, they have to do a study yeah? Maybe it's gonna take years but they gotta protect themselves that's why they do all this thing. But I don't see why it should be any problem because all they gotta do is follow the old pipe already.

V. CULTURAL RESOURCES/TRADITIONAL PRACTICES

A. Native Gathering Practices for Plant Resources

The following is a list of several Polynesian introduced and endemic plant species gathered for medicinal use, culinary use, and lei making were noted from the 'Ulupalakua to Kanaio region.

1. 'Ohelo (*Vaccinium spp.*)

Grown at 1500m above mean sea level (Abbott 1992:44), the leaves were used for tea to clear the kidneys and the berries eaten when ripe.

Nancy Purdy: Yeah they have, like the 'ohelo, ohia. I don't know what else they have up there but I know I used the 'ohelo for tea. That's where they can find it is up in the mountain.

The ohelo I was using for myself because his father (Uncle Dan's) said. I got sick after Danny (eldest son) was born and I went to the doctor but I couldn't stay in the hospital because I have a baby...so we stayed with grandma. And then his father told uncle to go and get 'ohelo leaves and boil it and drink for tea and that would clear my kidneys. It did help. And ever since I always used it...you know every now and then I would use it. Cause it's good because it helps me, I figure it helps me...

2. Māmaki (*Pipturus spp.*)

Used as an alternative source of kapa fiber, it has been noted, by those interviewed for this cultural assessment, that māmaki grows all over the mountainside of 'Ulupalakua. The early literature indicates that māmaki produced only top quality kapa (Abbot 1992: 50). In historic and modern times, the māmaki plant was used medicinally. An infusion prepared from the leaves of the plant is used for throat and stomach trouble, as well as general "run down" conditions (Abbot 1992: 102). This plant grows as a tall shrub or small tree. The leaves have a silvery lower surface and usually reddish veins. As recalled by Mrs. Nancy Purdy (Appendix D):

Nancy Purdy: Plus we have māmaki all over the mountain too yeah?

CSH: What was the māmaki used for ... tea?

Nancy Purdy: For everything, it's for everything yeah?

Carol-Marie Lee: The māmaki, you cannot take too much but, because your blood pressure goes low.

Nancy Purdy: Yeah. I can say something about that with myself, but I not going say it (pointing to the tape).

3. Kukui (*Aleurites Moluccana*)

Kukui was a plant commonly used as a laxative or as a purge. All parts of the tree can be used for these purposes (Abbott 1992: 100). Jeremy Wong (Appendix B) recalls:

...the *kukui* right by the ranch. The medicine that's why, they take the zap. I know plenty guys who go pick.

Some guys they drink the zap yeah? Keep them from getting sick.

CSH: And that's out by Ulupalakua Ranch?

Yeah, right in this section, right around in here (by the store).

The leaves were also used as poultices for swelling, deep bruises, or other injuries helped by localized heat (Abbott 1992: 100). The juices from the green nut, when cut open from the top, were used for babies suffering from thrush, Mrs. Alo recalls (Appendix E):

the green fruit, you know the young babies when they are born, after a while they have that white cake on their tongue. Hawaiians say it's air, but actually it's from the milk, it curdles and leaves this massive white on the tongue, that makes the baby uncomfortable, cause can bleed. So they use the green fruit. They tear of the stem and put the juices on there clean the tongue.

Other uses include the use of *kukui* in a relish known as '*inamona*. In this relish the kernels of the *kukui* were roasted, mashed, and combined with sea salt to make good *poke*. This relish could keep for six to twelve months.

4. *Lehua* and *A'ali'i* Flowers

The *lehua* and *a'ali'i* flowers are used in lei making and can be found in the lava flows of Kanaio:

Alice Alo: (It's all in the lava anyway. The *a'ali'i* is so spread out but the *lehua*, my favorite spot is on the upper road, the old road. I like it up there. And my husband told me the first time I took him to pick, "The Hawaiians, I wonder if they allow you to pick them." I said "Eh, before you even pick them, you say something. You don't go out there on the lava flow and just take!" He said, "Oh you know that kind stuff." I said, "My dad told me. You say something first before you harvest"

Maybe one year is the yellow *lehua* because they got it up there, and they got the pink, and they got the red. The pink you have to walk in far from the road and the red.

The presence of *lehua* in the higher elevations of 'Ulupalakua and the medicinal use of the leaves were also noted by Mrs. Nancy Purdy (see Appendix D).

Those interviewed for this study did not believe that the waterline improvements would have any negative effects on the availability of the plants or their ability to gather the plants.

B. Native Hunting Practices

The higher elevations of the Kula to Kanaio region are popular with the local hunters. Pheasant, pig, and axis deer hunting are popular pastimes.

Edward Hew: Before then, when we used to go up hunting, we not interested in these yeah (sites) we interested in the birds so we nevah look around.

...So I went Honolulu, work over there, I nevah like Honolulu, I came back to Maui to stay. My brothers and sisters, some on the mainland, mostly in Honolulu, I like it here so I move back here. I love my hunting and fishing.

Jeremy Wong: ... I bird hunt and pig hunt all through here...this area (Kama'ole and Paeahu area), I think this is the hill that the (Blue Hawaii) helicopter lands on if I'm not mistaken.

Blanche Hew: We brought him up (Jeremy Wong) and then he used to go hunting with the grandpa see. And he would walk, walk, walk, up the mountain, carry his gun but we don't let him shoot yeah when he was little. But good, that's how he learn, look how he learn a lot about the land already.

Mr. Sadao Otani recalls the difficult of hunting with the *pamakani* cover:

You know the *pamakani* was at Waihou ... used to be high as this I think (indicating chest high). And we had one bird dog, half-setter. If he track the bird and he went underneath there and he no come out...he following the pheasants yeah? You not walk; you crawl through because you cannot stand on top. And that dog is making noise following the pheasant, but now Ulupalakua look nice no more that *pamakani*.

Like the plant gathering practices, those interviewed for this study did not believe that the activities associated with the waterline improvements would have any negative effects on hunting practices.

C. Burials

Most traditional burial concerns centered around the Kanaio area *makai* of the Kula Highway near the National Guard training area:

JW: From here on (Ulupalakua toward Kaupo) I see choke stuff, that's where I see the most (Hawaiian sites). Especially in Kanaio, even down in Kanai...I now it's far from the line...but by the big hill like that we know all the graves and stuff stay. The Pilavo's they real educated with that, they know where everything stay.

CSH: Down by the training range?

JW: Yeah by the training range, yhat's why they kinda of never like when they were shooting the mountain, because, that mountain. Cause we ride dirt bike by the track yeah by Koboda's(?) place, if you go by the mountain and you look, my friend them, they know exactly where everything stay. Get caves...that's where I found the cave that I was telling you (Richard) was like right around here. But nobody know yeah because we no like tell nobody.

Historic burials around the Kula Hospital area may be a concern as many of the TB patients were buried behind the hospital the markers are long gone:

EH: But anyway there may be some graves up there from TB time. People who died and no can find the family and they bury them up there.

VI. SUMMARY AND RECOMMENDATIONS

A. Summary

A cultural impact assessment was conducted for the proposed Ulupalakua Water System Improvements in the *moku* of Kula and Honua'ula. Historic research of the project area was carried out to identify any cultural resources or traditional practices associated with the area encompassing the proposed water transmission and lateral corridors and surrounding vicinity. An attempt was made to contact present and former residents of Kēōkea, 'Ulupalakua, and Kanaio; as well as various organizations regarding cultural knowledge, land use history, cultural sites and traditional Hawaiian or other cultural practices in the vicinity of the project area.

It has been determined that there will be minimal to no impact of cultural resources within the area surrounding the project area for this specific project. There are, however, some social concerns over the beneficiaries of the water line improvements and what it may mean for the potential for housing development of the upland area and subsequent impacts on historic properties and traditional Hawaiian practices.

B. Recommendations

Although no specific cultural concerns were identified during the course of the Cultural Impact Assessment, the following recommendation is made in the event that inadvertent burials are encountered during construction for the 'Ulupalakua water system improvements project. State law (Chapter 6E, Hawai'i Revised Statutes) requires the following:

1. Stop all disturbing activity in the immediate area.
2. Leave all remains in place.
3. Immediately notify the State Department of Land and Natural Resources-Historic Preservation Division (DLNR/SHPD) and the county police department.

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APPENDIX A Authorization and Release Forms

Cultural Surveys Hawai'i, Inc.
 Archaeological and Cultural Impact Studies
 Hallett H. Hammatt, Ph.D., President



Oahu: 733 N. Kalaheo Avenue Kailua, Hawaii 96734 + Ph.: (808) 262-9972 + Fax: (808) 262-4950
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Authorization and Release Form

Cultural Surveys Hawai'i (CSH) grateful for the generosity of the Kūpuna and Kama'aina who have willingly shared their knowledge and experiences for the preparation of a cultural impact assessment for the improvements to the Ulupalakua Water System.

We understand our responsibility in respecting the wishes and concerns of the interviewees participating in our assessment. Here are the procedures we promise to follow:

1. You will have the opportunity to review the written transcription of our interview with you. At that time, you may make any additions, deletions, or corrections you wish.
2. You will be given a copy of the interview transcript you have approved for your records.

For our records, we ask for your written confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, Edward Ham, agree to the procedures outlined above and by my
 (Please print your name)

signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Edward Ham
 (Signature)

1-27-04
 (Date)

Cultural Impact Assessment
 Ulupalakua Water System Improvement

Cultural Surveys Hawai'i, Inc.
 Archaeological and Cultural Impact Studies
 Hallctt H. Hammatt, Ph.D., President



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3. You agree that the interview shall be made available to the public.

I, Blanche Hew, agree to the procedures outlined above and by my
 (Please print your name)

signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Blanche Hew
 (Signature)

1-27-04
 (Date)

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1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, Perry O. ARTATES, agree to the procedures outlined above and by my
 (Please print your name)

signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:


 (Signature)

1-26-04
 (Date)

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1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public

I, Richard Dancil, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:


(Signature)
2/6/04
(Date)

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Ulupalakua Water System Improvement

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1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, William E. Eby, agree to the procedures outlined above and by my
(Please print your name)
signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

William E. Eby
(Signature)

2/21/04
(Date)

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2. You will be given a copy of the interview transcript you have approved for your records.

For our records, we ask for your written confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, NANCY PURDY, agree to the procedures outlined above and by my
 (Please print your name)
 signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Nancy Purdy
 (Signature)
2/13/04
 (Date)

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 Archaeological and Cultural Impact Studies
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2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, Carol-Marie Lee, agree to the procedures outlined above and by my
 (Please print your name)

signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Carol Marie Lee
 (Signature)

Feb. 15, 2005
 (Date)

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1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, Sadao Otani, agree to the procedures outlined above and by my
 (Please print your name)
 signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Sadao Otani

(Signature)

2-10-04

(Date)

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2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, William Y. Uemura, agree to the procedures outlined above and by my
 (Please print your name)
 signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

William Y. Uemura
 (Signature)
2-18-04
 (Date)

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For our records, we ask for your written confirmation that:

1. You were given the opportunity to review the transcript of the interview.
2. You consent to the use of the interview with any revisions specified by you for historic documentation and academic purposes.
3. You agree that the interview shall be made available to the public.

I, JEREMY WONG, agree to the procedures outlined above and by my
 (Please print your name)
 signature, given my consent and release for this interview to be used for historic documentation and academic purposes.

Additional Comments and Clarifications:

Jeremy Wong
 (Signature)
3/11/04
 (Date)

APPENDIX B Interview: November 14, 2003 Kēōkea Park

Aunty Blanche Hew: *BH*
Jeremy Wong: *JW*
Perry Artates: *PA*
Tiare Wong: *TW*
November 14, 2003

Uncle Ed Hew: *EH*
Richard Dancil: *RD*
Kawika Bergau: *KB*
Kēōkea Park

JW: Plenty guys they don't know the springs, only the old timers yeah? Uncle *in audible* them.

BH: You mean Polipoli you talking about?

JW: Yeah, that's the main spring, but that branch off...

EH: *In audible*...Polipoli get three more springs...in Waiohu and all that.

BH: We used to go up there all the time, Polipoli!

JW: That's where get watercress, like that, everything.

BH: Yep.

RD: You see this area right here (referring to the aerial map), right down below here, at the cistern we had *Pakē* in there. Uncle Pat went mention that's where they used to run the donkeys.

JW: Yeah, you see, now I look good...

CSH: Between, after the Kamaole Tank (going toward Ulupalakua)?

RD and *JW*: Yeah.

RD: Right around over here, get one right-of-way you know.

JW: Get one right-of-way come down *in audible* road.

RD: Get Popo's (?) flower farm, but below that, right on the right-hand side in this bunch of trees, this is one right-of-way. And that is actually where they, Uncle Pat was saying, they went run the donkeys going up Polipoli before this.

JW: I know, because when I bird hunt and pig hunt all through here...this area, 'cause I think this is the hill (referring to the map) that the helicopter land on if I not mistaken..

CSH: This is the Paeahu lateral

JW: Yeah, so I know from this whole area get kind of good sized stone structures, stuff like that. It so old, and sometimes the grass is so tall, that you can only see them when the cattle go inside. The cattle eat 'em back down and you can tell where everything stay at again. But every time I ask dad for tell me...used to have *Pākē* people used to populate this whole

are right here, this is Corn Land right above this hill where the Blue Helicopter land every time, you can see 'em from the road even, this is all...they say this is Corn Land where the guys used to grow vegetables and stuff like that. All the stuff is old mossy rocks, the kind old Hawaiian style stuff, could be they just had move in, the stuff was there already. The only one that I see one big one, can see down inside that's the only one get mossy rock walls and can see the platform. The rest is all this authentic, this old kind.

EH: In audible...inch.

JW: No, No, they not putting pipe in or concerned about the pipe where the thing going, yeah?

CSH: No, No, there is already a pipe running, what they're gonna do is increase the diameter of the pipe...six to 12"? (Later learned that it was a maximum of 8" diameter pipe and clarified.)

EH: What about this Kēōkea line? They gonna start from the Kula San line or start from Thompson's Road?

CSH: They gonna start from the Kamaole Tank, this stretch in here (indicating map from Kula San to Kamaole) is for future consideration but they're making it a part of this EA so they don't have to do it ...

EH: Like in audible...

CSH: Yeah. So right between this Paeahu lateral and the Kama'ole tank, there was a lot of Chinese settlement in there?

JW: From what I was told.

EH: That's were they used to live, they used to live over here (referring to area between the Paeahu lateral and the Kamaole tank), but I don't think you can find any graves with the Chinese, because they weren't there long enough. They was all in here, but like I said could have been Hawaiians yeah? (The structures)

JW: Yeah could've been, there was all rock structures like how you find down in Kamaole. Same kind style.

CSH: Yeah we found some like old rock walls coming up on some of the bedrock, the outcrops and gullies...look like they build up the gully.

JW: Yeah.

CSH: Look like, and then we found couple terraces, this one (referring to a digital photo from the archaeological assessment) is right after the Kula Sanitarium tank.

EH: Yeah well, maybe up there.

BH to EH: Try look (at the photo), see if you recognize it.

JW: Up in the grassy area get plenty like that (as in the photo), but as far as tombstone kind like how I see down the ranch, not too much...unless you go further back. Once you get back into kind of this more rocky area I would say I see more.

EH: Before then, when we used to go up hunting, we not interested in these yeah (sites) we interested in the birds so we nevah look around.

JW: But I can tell from here, from above the *pu'u* get plenty of this kine small kine piles yeah. We used to think that maybe was grave stones every time, cause over there get little piles of stones but nice yeah. But I don't know what is that, I just look I don't know what it could be but...somebody went pile 'em up.

CSH: Like this? (Showing a photo of a rock mound from the archaeological assessment.)

JW: Yeah like this, all nice like that. But just little piles of them.

CSH: All over up there in the pasture.

BH: Just piles? Or is it like in a square.

JW: Like this, piles.

BH: Oh, oh.

JW: They just stack 'em up nice like that, like they had bury something.

BH: Okay, I want to tell you something. You see my grandpa is Chinese, yeah, and you know the land we have up here (near Kula Sanitarium), it's homesteaded by him. And he farmed this land up here, and all the stones that they found, they pile 'em up.

JW: Yeah that's another thing yeah.

BH: Yeah.

JW: The Chinese, they used to do that too you know.

CSH: And they make it real nice.

JW: Yeah they pile 'em so all the stones stay in one place yeah.

EH: That, it's not grave.

BH: It's not grave.

EH: It's not grave.

JW: Like this one (referring to photo), this one is a good example I see plenty of this.

RD: You see right down this part over here...

CSH: Which part?

RD: Coming down around over here.

CSH: The gully after Kamaole Tank?

RD: That's where *inaudible* went find one 'ulu maika. So might have had some kind of influence over there.

JW: So more or less you like know if we see plenty of this kind (i.e. rock piles, archaeology) around yeah?

RD: And any kind of cultural practices.

CSH: Or even if you know if like, some *halaus* or cultural practitioners like to go up and maybe use some of the plants or go up to even...

JW: Yeah, I know some guys...the Kukui right by the ranch. The medicine that's why, they take the zap. I know plenty guys who go pick.

RD: Kukui?

JW: Some guys they drink the zap yeah? Keep them from getting sick.

CSH: And that's out by 'Ulupalakua Ranch?

JW: Yeah, right in this section, right around in here (by the store). My house is right here (near the store). But if anything from this section up, I know get plenty of this stone things (the area between Kula Hospital and Ulupalakua Ranch). I see choke of them. Like I said plenty of them is like that, the grass growing all through them. You gotta look good to see 'em. Then when the cattle goes through, then you can see them good...like it was there a long time but you didn't even know it was there. So you went walk then, some of this already.

CSH: Yeah we walked the whole thing actually. Couple of guys came from Honolulu came the day before...and they walked from Kanaio, so they walked from Kanaio Town around to here (the last lateral with the corral at the end) then down this lateral, the 'Ulupalakua lateral. Then that day we came, with the guy from Honolulu, we walked from Kula San up down...

JW: So you did all of this already?

CSH: Yeah and we saw...that's what we saw (referring to the photo) between the Kamaole Tank and Kula San was those terraces.

PA: So only in this short section you saw this. This is not generally what else...

CSH: No we were just walking the corridor. We did find some terraces down toward the rock wall over here that goes across...

JW: By the *pu'u*, the big hill yeah? Yeah this is an old rock wall right here...and the road follow that rock wall upside of the wall.

CSH: So before we hit the road, we came across a couple more terraces. It was coming down like in a wash, in a gully wash. So we were trying to figure if maybe that was Hawaiian or ...

JW: Chinese...I remember because they call this, I know this pasture is called corn land (where the Paeahu lateral is located) because they used to grow corn over there. And they used to farm them all...I know we used to find old bottles.

PA: So it was more civil back then, I mean if you found bottles that's civilization.

JW: Yeah. Old artifacts.

CSH: Yeah, we did find a Maui Soda...

JW: (laughing) That's why hard in the pasture where they went move stones around, you don't know what they went touch yeah?

PA: Then too yeah, the people who do the rock wall...

JW: Yeah, they just grabbing the rocks...especially this kind rocks (pointing to the photo).

RD: Cause they went grab plenty for construct...down Kama'ole (?).

JW: You see down over here when you walk guarantee you see one Tongan pass by full rocks in the back of his truck and I don't know where they grabbing them from. Every once in a while I see them passing by with just loads.

CSH: They just go up in the pasture and collect the rocks?

JW: They just go ... Kanaio...yeah they just grab. How much times we went kick them out. The Samoans, they just park on the side of the road and they just walk into the field. They make lines, about twenty of them.

PA: Lines?

JW: Then they just hand each other yeah? Then you look in the truck, get two guys in the truck sitting down with all the stuff, and another truck with all the guys in the back following that truck. They just go to the job, I guess and drop the rocks.

PA: You had encounter them lately or..

JW: This is when I was working at the ranch, that's when we used to go see them. Cause when we driving up to go work, they stay on the side of the road early in the morning yeah? They go pick rocks like that, especially this kind mossy rocks that's what they're all there for. This is gold for them right here. They sell this down to the *Haole* and the *Haole* they make nice kind walls. They steal `em, then you don't know where the rock came from?

PA: They don't know the historical...

JW: Yeah the significance of that rock. Could have just went fall down and the thing stay on the ground by itself, or got moved but at least the thing still stay in it's home, in the area yeah?

PA: But Uncle, by your recollection, the *mauka* side of Kula Sanatorium was mostly Chinese habitation?

EH: Yeah, yeah...all from Kamaole, all the way over to up here (pointing above Kēōkea Park) olden days.

BH: All the way up the mountain, mostly up the mountain.

JW: That's why you find all those bottles and stuff up there, you can tell people was living there.

EH: Most of the Chinese that came here, they make there money and back to Honolulu they go. Send their kids to school.

BH: Mhhmmmm.

EH: So you go up to Kaimuki (Oahu) from 6th Avenue, let's see now...Harden, up to Moanalua yeah and from 6th up to 12th all *Pakē* over there before. Majority.

CSH: And what were they doing up here? Farming....

EH: Corn, or what ever, they farm everything.

JW: Vegetables.

EH: And with no water (irrigation), everything would grow. Used to rain, olden days, almost every day rain. I used to go to school (Kula School) there I used to live up here, at least two miles from there, our school was right here. Used to walk every day with out shoes, rain and all. So I went Honolulu, work over there, I nevah like Honolulu, I came back to Maui to stay. My brothers and sisters, some on the mainland, mostly in Honolulu, I like it here so I move back here. I love my hunting and fishing.

CSH: So you were born and raised in Kēōkea?

EH: Up there.

PA: Chinatown? (Community located above Kēōkea Park along Middle Road.)

EH: I had work Pearl Harbor and then after that, I left Pearl Harbor and I work outside for private in construction.

PA: So majority of the people live over here before, Uncle was Hawaiian Chinese, basically?

EH: No was mostly Chinese. Had Hawaiians too, but I didn't know too many of the Hawaiians. But when I was growing up, I know Chinese. I know some Hawaiians, but not that many as Chinese. (Sun Yat Sen's Ranching Operation)

JW: They more back by the ranch yeah?

EH: Would be hard to say by Kamaole ranch now...the Chinese run it before. I didn't know that, but I read about it there.

CSH: So the Chinese community, mainly agriculture and ranching...I didn't know they were active in the ranching...

EH: Even me, I didn't know. But they was mostly on farms. Not big farms, but enough for them to make a few bucks I guess. And then they wait until they transport their food and stuff, vegetable, by horse and buggy. I never did see, but that's what I was told.

JW: Even me same thing. Every time I see stuff I ask my father, from here to there (Kula to Kamaole) all *Pakē* pretty much. The people just raising things yeah? You can see the terraces they make then the grass would grow all over them.

RD: You can see them...

JW: Yeah when you walk you can get a better...

PA: Basically too...Uncle guys used to tell the story that they used to send the donkeys down with the vegetable back then to Makena Landing.

EH: Donkey?

PA: Yeah, donkey with the pack.

CSH: Did they trade much with the people who lived in Makena...for fish and ocean stuff.

EH: That I don't know.

JW: That I heard from my Uncle Andrew. He used to tell me they used to trade. They even used to come down to the ranch and trade for beef. Uncle Andrew said when he was one small boy, he used to tell me that. He just had pass away. He would have been a good guy to talk to. Even Uncle Merton. If anyone would know about this section, would be those guys. Uncle Merton...yeah Uncle Dan...still top shape and he's 80 he would know plenty.

RD: He's still driving too.

JW: Yeah Uncle Dan, he's still driving.

EH: They gonna lay this line, they gonna bury?

CSH: No gonna be Driscoll pipe.

EH: Right on top yeah?

CSH: Gonna lie right on top. But the line from Kula San to Kamaole is buried, partially, so they gonna have to go...uncover that. We could see some of the line when we were walking the corridor.

JW: Uncle Andrew the one pretty much told me all the stories for over here (Ulupalakua area). He used to work for the ranch. Within this area he used to tell me that's all *Pakē* sites...like where they used to just live and stuff. It's probably like this section, it's mostly grass, I never see too much of ...if get anything, stay covered. It's mostly grass.

EH: Had some Japanese farming up there too.

JW: From here on ('Ulupalakua toward Kaupō) I see choke stuff, that's where I see the most (Hawaiian sites). Especially in Kanaio, even down in Kanai...I now it's far from the line...but by the big hill like that we know all the graves and stuff stay. The Pilavo's they real educated with that, they know where everything stay.

CSH: Down by the training range?

JW: Yeah by the training range, that's why they kinda of never like when they were shooting the mountain, because, that mountain. Cause we ride dirt bike by the track yeah by Koboda's(?) place, if you go by the mountain and you look, my friend them, they know exactly where everything stay. Get caves...that's where I found the cave that I was telling you (Richard) was like right around here. But nobody know yeah because we no like tell nobody.

PA: Sometimes that's...keeping it secret is good. yeah

JW: Yeah.

PA: But I think when projects, start happening like this...

JW: Yeah if was down here then maybe tell `em yeah.

PA: It needs to be open so that you know, things can be corrected.

JW: Yeah, go around `em.

RD: Yeah if they have an alignment yeah.

JW: Even my dad would be good to talk to about this. I know the area ... but what ever I see now is all visible, plenty of the stuff is all overgrown. This forest right here. (near the ranch)...get *ti* leaves, *waiwi*, mango trees and that's the only forest I see this in. All the rest of the forests I no say nothing as far as fruit trees go. From here on (near Polipoli) all in peaches. I know the Chinese plant plenty of those peaches yeah?

CSH: Peaches?

JW: Peach trees.

BH: Yeah, but you know, up there by Polipoli all kine fruits.

JW: Yeah I know I seen avocados one time.

BH: Pear, apples, plums.

CSH: There's cherry trees up there in Polipoli, I saw one time I was all "Eh that's a cherry tree."

PA: Get plums...the sugar plums.

JW: Yeah even get figs!

EH: But I think for me, Kula San over...there is nothing wrong I don't think.

JW: If anything plenty of the farmers would've all ready got em. Dig anything up. Cause that's were all the pigs stay.

EH: The waterline going down going down Kīhei too?

CSH: I don't know of any plans like that. For now it's just the waterlines going down...

EH: The main lines.

CSH: I think Seibu was drilling for their prospective development down in Mākena.

PA: Looking for water?

BH: What about up here, where the big line is? Going up, how far does it go?

EH: They going tie into 'em, the Kula San tank down to Kanaio.

BH: Get that big line up there uh?

PA: At least one thing could explain is that from here in Kula was Chinese community and further go down to the *paniolo* side was more historical Hawaiian artifacts.

JW: Yeah exactly, once you come past this place (Kama'ole) was...

EH: I was just going say, from here on...

JW: It was Hawaiians yeah? As far as I can remember too that's all Hawaiian.

CSH: Uncle, can I ask how long you live in Kēōkea? From what years to what years?

EH: From the time I born till today.

CSH: What year were you born?

EH: 1923. This month, I make 80. I give you one example. But I don't know if you believe this kind, but my mother told us...that's when Haleakalā was active before, when my mother was her age yeah (Tiare – 3 yrs. old)...and then they say that Pele come over to their house and she can change yeah? From ahh, I guess Hawaiian to *Haole* to Portagee...whatevah. So from when I was very small growing up we see anybody, wherever, don't play games, don't make fun of them ... stuff like that...because that could be Pele yeah? One more I can tell you is this *Haole* told us about down Rice Ranch yeah? But I heard this from my mother already, that Pele went come this people's house and wanted food and they went chase her away,...chase her away. So...she send the volcano yeah? The fire...

TW: Papa....

EH: Yes?

TW: I want a *inaudible*...for you.

EH: Baby...you say "Hi Aunty"

TW: Hi

CSH: Hi.

EH: But as I was saying, Pele went send the fire burn the house yeah of the people? They went run from the house, run down the to down there ... right below here (Kēōkea Park) ... you cannot see it from here. But if I take you, I can show you the footprints.

JW: Yeah, that's something you should get right there. I tell you what, nobody even know where that stay...only him...the rest of the guys are all dead already.

EH: It burnt all of them, the father, mother, and one child. And get the footprint (in the lava) of the mother, father, and the baby. Only one small kid. And Rice told me and then he had show me. He told me what happened...the *Haole* now. So anyway what is now wasn't as bad as the olden days.

JW: Yeah that place that I was telling you guys had that big stone wall thing and cement floor stay right behind that wall. Cause get the stone wall right above here yeah...stay right behind that, I think that's the avocado tree. That's the one by the *pu'u* yeah? You guys was to the left of that yeah? (Referring to the photos of the terraces off of the Paeahu lateral.) This is what I see choke of this ... all through the ranch, but like I said, when I tell the old-timers...they say it's from the guys who used to farm the land.

EH: I think you stay up here, it's safe...but Kanaio, when you go down, I think...but up here is alright. Down here you find graves...

CSH: Down on the *makai* of the road?

EH: You know where Hawaiian Homes stay.

CSH: So the folks that used to live in that area, the Chinese settlement area, there's nobody that would have any concern? Everybody stay Honolulu already?

EH: I think when they left nobody...then when the ranch came...they took over.

CSH: So you work for Ulupalakua Ranch now?

JW: I used to work for them, my dad works for them now. But we was ranchers all our lives. My dad and my grandpa and my mom used to work for Honolua Ranch. Then after we came back to Ulupalakua Ranch when my dad got that job. Now my dad works in 'Ulupalakua. But my dad used to work Kaupo too, and back there I know get plenty stuff.

BH: We're not gonna see you again.

CSH: Hopefully soon...hopefully. We will hopefully be able to conduct more interviews; maybe talk story little bit more if you remember something else.

BH: Because we got interviewed for ... did Richard (**RD**) tell you that they're getting a memories for 100th anniversary of the hospital? Yeah and we all went, um ... Pat Mau and Eddie and I and another couple. Richard...you didn't tell her about the interview that we had?

RD: Oh we did one around April, the 100 year anniversary for Kula Hospital.

CSH: Yeah, I was at a commission meeting this morning where they were talking about putting the hospital on the National Register.

RD: Oh the thing today.

CSH: Yeah, the county wanted to approve that.

BH: I was gonna tell you, do you know we cannot even change the windows up there?

CSH: Yes!!

BH: I said of all things, the thing is leaking and what not, and we cannot even change them? But it's a ... what do you call that? Landmark, yeah? It's a historical thing.

CSH: So they gotta, they can change it, but they have to change it in a certain way...they call it changing in kind. So what it was in the '20s, they gotta make it just like.

BH: My dad worked up there you know. He was in charge of the maintenance department. So I worked there for 17 years and ten months. And he worked there and his father worked there. His mother at the hospital.

CSH: So is there a lot around the hospital grounds? Do you recall seeing any older, non-hospital, things that weren't related to the hospital maybe Hawaiian stuff...or native plants.

BH: No...oh native plants maybe. Yeah Richard? Native plants.

EH: Up there, up there no more.

BH: Ferns...no, no, *ti* leaves.

EH: But anyway there may be some graves up there from TB time. People who died and no can find the family and they bury them up there.

CSH: In the pasture? Did they mark a lot of the ...

RD: The person you gotta talk to is Doctor Andrews...because he was tight with the Hawaiian community back then. This guy doctor Andrews used to work up at the hospital.

BH: He was the doctor there, and Eddie was his yardman or whatever? The kind that the doctors used to have a special person to cater to their needs ... take there kids to school. He has a lot of stories about what he did. Take the kids go horseback riding.

CSH: So Richard, how long have you worked at the Hospital?

RD: Since about '85.

CSH: Born and raised Kēōkea?

RD: Yup.

PA: Those days we used to go after school...Kēōkea School.

BH: In my tape I have where I went to this school too, in my tape. Who's his favorite teacher? They ask me that.

CSH: Who was your favorite teacher?

BH: Mr. Carvalho. Elmer Carvalho is my classmate, and his dad taught school there.

CSH: What subject was that?

BH: Oh...reading, math. We had till 8th grade. When you went school, had till 8th grade?

PA: Yeah.

BH: Who was your teacher?

PA: Brandt and Miss Kapoha.

BH: Eh...Miss Kapoha? Ida?

PA: Those days the Campbells where living down there. Campbells, Uwekoolani, Kaiokamalie. My classmate was Alvin, Alvin Kaiokamalie.

BH: Oh that's our family, Alvin.

PA: That's the one went pass-away. He went go fishing...that was my classmate. Those days we used to do the maypole in our May Day time.

BH: In your days did they have the dental hygienist who came by and learned to brush teeth.

PA: Yeah and they put that sour thing inside your mouth. That's that fluoride stuff yeah? And before, when Mrs. Brandt was our teacher, we deliver the lunch can in the band-aid can ... the lunch money in the band-aid can. We used to put on the Indian headdress and one be one Indian and one ride one stick horse together to go deliver the lunch can... (laughing)

BH: See, you get plenty memories too. And you know another thing too. Lunches, I don't know about when you went to school, but when I went to school it was only a nickel. My father had a hard time giving us a quarter you know for lunch.

PA: Roderick too...you know Roderick he's our classmate. That buggah used to make me go steal money, ah steal candy, from Popo and go in the back of the store where get the bag rice and we eat all the candy. So Popo used to think me was the stealer yeah? But I was stealing for his own grandson!

BH: (laughing) They know they not going get it if they go and ask. Ah those were the days, and we survived you know we didn't have money. But I was May Day Queen you know on time.

PA: The rivals before was Kealahou and Kēōkea, you remember?

BH: Yeah!

PA: Kealahou School, where Haleakalā Waldorf (Kula) stay? That was Kealahou and this was Keoekea. But always used to get rivals before.

BH: What about 'Ulupalakua? Maybe they closed it already.

JW: Yeah, was closed already.

BH: That used to be our rivals too.

PA: I know before...you could tell when somebody get 'ukus because they smell like peanut butter! Because you put peanut butter yeah? For *hemo* the 'uku.

BH: Is that right? I never knew that.

PA: Peanut butter or kerosene.

BH: Kerosene. I wonder where these *ukus* come from.

PA: From the chickens!

JW: Came from the mainland. Before never have that, never have nothing.

BH: Oh but we have good memories and we survived. We didn't ever have money, but we survived.

PA: We used to get, like one small farm.

BH: Exactly! That's what in my tape I said we all had to work in the garden.

PA: Yeah.

CSH: In the same farm? Like a community farm?

PA and BH: No not a community the school.

BH: And we raised vegetables for the cafeteria.

PA: In those days, you naughty, they give you a toothbrush and you go and scrub the bathroom with the toothbrush.

BH: And you know the two rooms still standing you know.

PA: The one on the top?

BH: Yeah and then the bathroom too down there. Then one time, Elmer talked about developing that for camping grounds. You know if people want to camp with their families and stuff, but *pau* gone already. But that's what he had intentions of. And the old Kapoha school is still there and it's in the Parks Department yeah? The Department of Land and Natural Resources. So our church has use for it, we were gonna get like a youth thing going and it never developed. The people went down, cleaned up, and do this and it never happened. You know what we want to do is get the Hawaiian Homes people coming to our church. One Sunday we had a whole row of the Hawaiians, but they never come back.

PA: You know who stay...the church right here, the one on the corner?

CSH: Haleakala?

PA: The lessees, one of the lessees, is actually like the pastor for this church.

BH: Jimmy....

PA: Aarona!

BH: They're going up there? But you know what we wanna do? You see we bought land, down below the church four point something acres we bought. Not interest but like a balloon payment, so when the time came, it was over a year ago we paid it off. Good because we got pledges from different people. We want to make like a picnic grounds over there...you know Cleghorn? He retired yeah now. So he took that as a project and he cleaned it up all the stone and everything and now he lawn mowers that place and keeps it real nice. So one of the suggestions is that we should invite the Hawaiian Homes

people come up and stay on that, you know picnic like...join us. We want to get to know them you know that kind of thing.

PA: Get plenty activity you know in Waiohuli.

BH: They gonna have there own activity center?

PA: Get one area already for park use. And last night I met with Planning Department from Hawaiian Homes.

BH: They even come inside and advise you folks ... the planning.

PA: It's actually what they going facilitate with the Homestead. You know we have the Waiohuli Association.

BH: I thought it was going to exclusive. Nothing going on on this end yeah? (Kēōkea Homestead.)

PA: Gotta transmit the water that's why. Gotta get water before they start developing.

BH: We brought him up (*JW*) and then he used to go hunting with the grandpa see. And he would walk, walk, walk, up the mountain, carry his gun but we don't let him shoot yeah when he was little. But good, that's how he learn, look how he learn a lot about the land already.

CSH: Very knowledgeable.

BH: And you know they talk about water meters. Look at all these houses coming up? Look at Sam Wiwela; you saw the big article in the paper. How many years he waited. 11 years.

PA: You know, I went to one hearing. Poor man almost crying on the podium you know. I feel so hurt because, here you see all this happening all he like do is get water meters for his two kids and they no can get the water.

BH: And all of us is local people....

CSH: These houses have water meters up here (*mauka* of Kēōkea park)? They all not catchment?

BH: Yeah, look at that house, all must be. But one thing I have to tell you. You know Charlie Ota has his property and when you get to the turn down here, and you look down and get one cement road going up. And it's county property! And before we could say anything, the cement trucks came and poured the road before we could even say anything. You know they don't let the public know...it's really not fair.

PA: You know *inaudible* no more water meter.

BH: But other people get.

EH: I don't know but to me you have to be lucky is all.

BH: Eh you know we waited a long time for us to get a water meter up here on our own property. A long time, my mother died and everything before we got the meter. But we had to go and bargain with the water company for an easement to put the line through. But you know this Pereira they went survey our property how many times for put the waterline...this side, then they come this side and it's supposed to put it in within five years and they never do it. So they had to run the pipe across from my mother's house, all the way across...driscol? All the way around the corner. Like I say, there's all these homes going up and how did they get water? And big house! And now it's for sale! The people built the property and I don't know if they can't afford or what it is...big for sale sign...never move in! Real big bucks!

CSH: Is that all affect the tax assessment for the local community?

BH: Because they build that? I don't know.

PA: The land owner that's been there for a long time, and then a house that comes up right next to you and it's a mansion the value of your property going up to. The value going skyrocket. That's the domino effect. When you look down in Makena and get one old family down there that they living for how many years...

CSH: We saw that happen to my grandma's property.

BH: I feel sorry for Sam with all those houses up there, I feel for him.

PA: When I sat on the County Council meeting the poor man went bang his hands on the podium..."We been waiting for water, and only get two kids, and I been asking for water meters for how long. Then somebody come up right next to me and he get his water meter. How can you guys..."

BH: I don't blame him. And who gives that out the Water Department?

PA: Yeah.

BH: You know, they have a moratorium...nobody get...but you see...look at these two houses in the pasture...

PA: And then if you look at the Water Department, they have a list for water meter and where you stay. Then if you look at it people that no even exist...they apply for water meter they get one water meter.

BH: Yeah, you're right. There is so much going on, you wish you can get in there and fight `em all.

PA: You know, there's one right that is always given to us, and that's for put on "X". The right was given to us, even Native Hawaiian, to put one "X" so if you get every Hawaiian that can put at least one "X" then the American flag we going to put to one vote. We gotta

vote. We gather all the Hawaiians, half-breed, whatever it is, we say here's apples here's oranges. The majority of us going pick the apple, we put anybody we like in there (office). But it's not like that.

BH: He's half-Hawaiian.

PA: The local people we gotta stick together. They dismantling us already.

BH: Don't you feel like it's our lifestyle. We're so easy going? You know the Hawaiians...so easy going. From way back when we give everything they have.

PA: We allow what happen to us. We allow everything that has happened. The strength is always in numbers. You have numbers, everybody go whoa!

PA: That's why Martin Luther...

BH: King! Yeah.

PA: He made a point. Hawaiians gotta do the same thing. March in numbers.

RD: Hard for find a catalyst.

PA: You know what, no wait till it's too late...

BH: But when you look into the history you can see how they seized the palace and put the Queen in isolation.

PA: They dismantling us slowly but surely...Kamehameha Schools....and the trust money...they opening up a can worms. You open up the can of worms ... who the crooks? The Hawaiian people was crooking too right? So that doesn't make us look any better...Bishop Estate. I told myself ... I going run for the hills...that's why I came back up here. To me this environment more secure because the population only going grow. Mostly people coming back home to raise their family. That way we going get the majority of us...not the minority. And that's what the other associations are afraid of. They are afraid of our population (Hawaiian) growing.

(End Tape)

The tape ending became a cue for the interview to wrap up....and thank everyone for taking time out of there day to talk story.

Mr. Otani: *MO*

Mr. Bill Eby: *BE*

Mr. Bill Uemura: *BU*

Tanya L. Lee-Greig: *CSH*

Omaopio, Kula, Maui

January 30, 2004

An interview was conducted with Mr. Otani, Mr. Bill Eby, and Mr. Bill Uemura on January 30, 2004 by Cultural Surveys Hawai'i at the Uemura Farm in Omaopio, Kula.

MO: As far as working for the ranch...I nevah work one day except for the branding...that's 'Ulupalakua. They wanted, Mr. Von Tempsky, he was a good friend of our family, I was young boy yet. He told us go clean that *pamakani* ... used to be a vine. But...

CSH: So you helped to clean that *pamakani* up there?

MO: Yeah, we used to go clean that *pamakani* they give you a lease for, they lease you the land for three years with the understanding that you clean as much as you want. So we started from there, then, ahh...first was Waihou. Then I ended up in Pu'u Mahoe that big hill on top. Right there back where the radio station was.

CSH: In back by Pu'u Mahoe?

MO: Oh it was a nice place...so I stayed there three years and then from there I came back. I farmed there three years.

CSH: Were you born and raised up in Kula?

MO: I was born in this district. So when my parents...first they stayed up by what you call that...

CSH: So you were born in Omaopio?

MO: Yeah, I was born in Omaopio way up above...you know where Richard Baldwin's House is?

CSH: Yes!

MO: Above that.

CSH: Wow, that's high! And cold!

MO: Cold yeah. You see it's a long story the way the farmers had...had this Chinese guy, Ah Sui, and then he's one from the ranch. Not only myself, quite a bit of ah...of course this man died already...Koga....like now they just stay here one month, they say "I'm an Old Timer!" But he said this Koga man used to say he knew...we were old timers. He say those that started in Kula they used to call that (the area where he was born) Ah Sui Pa you know. And then the old

people that had...I was born in Ah Sui Pa. From there they started to come out to Kula side...get Ah Sui Pa, then one more down from the Chinese Hongwai Pa, then had this Frank Correa the Portuguese landlord you know...Frank Correa they say he's now ...they made Portagee Pa...you know the old people...then came to Von Tempsky's up above, then they say *Haole* Pa...yeah *Haole* Pa, Portagee Pa. Oh it's so darn long already...you forget. When we bought this land here, my mother was still living yet. See when you folks coming back to bird place district...but then it's only the difference between up above and down below. When you look from here...it's quite a ways.

CSH: So what year were you born here in Omaopio?

MO: I was born 1912.

CSH: 1912...and when did you move from Omaopio to Pu'u Mahoe.

MO: Oh that's so long, I gotta really think...if not (laughing) I give you all kine stories yeah?

CSH: Can you tell me the story of how you came to be at Pu'u Mahoe? How old were you when you were out at Pu'u Mahoe.

MO: Pu'u Mahoe...I was just young yet...I just got married. So my two daughters were born in Pu'u Mahoe...so like now I have more grandchildren, great-grandchildren...I cannot keep track. Twenty something or thirty something grandchildren, great-grandchildren...I have a nice family.

CSH: That's a nice sized family.

MO: Oh yeah. I was told "You damn fool you go give the land to the girls you know." I said, "What's the difference between a girl and a boy? They part of myself." So like my son-in-law, this one here is married to my second, no...third, but you see that's a difference in opinion you know. Some parents don't even think of there children, but me I feel...no...that's why I wanted to get a start. So I bought over here (Omaopio). I made sure that each child get the road frontage.

CSH: Can you tell me about what you used to do out at Pu'u Mahoe? Where you farming?

MO: I had three year lease with the ranch. Mr. Von Tempskey and us where family friends. My father used to work for the Von Tempskeys. I think the Von Tempskeys now they all, the family, I don't think get anyone left here. Bill knows the Von Tempskeys well. Oh I haven't seen Bill in how many years?

CSH: Did you and he work together? You and Bill work together?

MO: No just friends and you know we love horses so we used to go every year when they have the general branding, like that, we used to go...and that's when we had the fun.

CSH: So you know all of the pasture land up there? You road up there a lot?

MO: Yeah. I even have my old saddles. I have two saddles; I have two boys so first off given for the boys yeah? But my sons, none of them interested in that. Of course my grandson yeah. He got the buckles...you know the silver buckle?

CSH: Rodeo?

MO: Yeah from the rodeo. He's in, he love the music...he's talented anyway. I hope I can go back to my young days...but it's just wishful.

CSH: At least we can remember. We were walking around in the pasture, up back behind Ulupalakua Ranch, and I guess what used to be Kamaole Ranch...and we found all these rock piled up all nice but we're not too sure about where they came from. Do you know anything about those piles of rocks? Were they there already?

MO: Where are those pile of rocks?

CSH: So we found all these rocks all in here (referring to the aerial). This is Ulupalakua over here and Pu'u Mahoe is down here somewhere.

MO: Now wait now....

CSH: This is Kanaio...

MO: Kanaio, yeah...

CSH: So we found rock mounds all in between here...this red-line here is water lateral gonna come down here, and the Ulupalakua water line that comes back down here, back behind the ranch. But we found all these piles of rocks ...and we not to sure if the cowboys pile em up or maybe old time Hawaiians?

MO: Oh ... maybe I didn't go that far to see.

CSH: And then this side, this is Kamaole in here, the Kamaole water tank and Kula San (referring to the aerial) and all these terraces in here, we came and we looked at those.

MO: Maybe Bill (Eby) might know how come all that rock piles and

BE: Before, nobody care about a rock pile. (Laughing)

BU: This one going right through here?

CSH: This one, from the Kamaole tank to the Kula San tank back here. This is all for future consideration. Right now, the current project is from the Kamaole tank ... all the way over to Kanaio. And this lateral comes down here, behind Ulupalakua Ranch and down further to *makai* of the road. But see we found all these rock mounds all through out this corridor, and some old terraces that we weren't sure if the cowboys did is to clear pasture land or if was there before.

BU: Yeah, some of them might be old house sites that the people who lived in the area might have used.

CSH: So what they're gonna do is increase the diameter of the pipe, from what I understand to a maximum of eight inch.

MO: You know some of those old Hawaiians, you know Hawaiians, they never really value land I think. They just give em away.

BE: Start where Tanya, Kula San?

CSH: Actually, this one is gonna start from the Kamaole Tank, in between here is for sometime in the future, they not gonna do it right away.

BE: Where is the Kamaole tank? By those houses?

CSH: Yeah, the avocado...

BE: Oh yeah, the avocado farm.

CSH: So you guys used to place all in here? Ride horse?

BE: Yeah. Did you ever go chase those wild horses?

MO: No that I never did.

BE: Used to have wild horses...

MO: Up the mountain yeah.

BE: That was the fun for the Kula boys on the weekend, go chase those wild horses.

MO: Everybody call up...one day this Peter Malino that used to work for Rice (Ranch) and anyway he got he bought this horse, but eh...that buggahs can run boy yeah. And good thing that buggah didn't run by me and put the rope. What you call, my brother he had that black horse yeah, you know way up by that Haleakala Crater Road, that junction that coming down. We started to chase them way down hill. But that buggah just went up till that end, so he was corralled upside next to that *inaudible* place, and me I was more on the gulch side. Good think I never...he went through the rope that damn buggah *inaudible*. So he was, that horse was way out in the corner...we went try catch em but oh he made up his mind I think, he going run. Eh, Peter Malino had one ten fathom rope, and he was on a mule! He never even get the chance to hold the end of the rope...yeah. And my brother had one eight fathom rope, but with the speed and he didn't even throw and that coil just was down. When the rope made one (indent) on the pommel. When the rope cam to the end ... Peter Malino never even get the chance to hold his but my brother's one, the rope went so fast out of his hand, but he dropped on the pommel and it just

(indented) the pommel. Lucky I nevah throw cause I had one *hapalaka* horse yeah? But oh you cannot ride bareback, anything...but oh that horse (the black horse) was runnin. When I saw that horse, boy you, four legs up!

CSH: What does that mean *palaka* horse?

BE: Half-broken, *apalaka*.

MO: Half-broken yeah.

CSH: And you were chasing wild horses on a half-broken horse?
(Laughing)

BE: Pretty brave!

MO: Yeah but today, what you call? The horses all from young you pet em, you place with em.

BE: Those horses all died. Chasing them one day and they went over the cliff, one went over, all went over.

CSH: Where?

BE: Up top the mountain.

MO: That was a risky chance you taking...now no more mountain horses.

BE: When you go up to Waihou, where were you farming? How do you go up? By Thompson place? To go Waihou.

MO: We used to go in the Sanitarium.

CSH: Can you tell where the springs were?

BE: Oh way up.

MO: Oh but now no more that *Pamakani* you can look at the whole hill and ...

BE: The whole mountain was *Pamakani*.

BU: That's what he used to say...they had to clear out the *Pamakani* to farm.

MO: But that thing used to kill all the horses from the ranches yeah?

CSH: How come.

BE: The fuzz from the flower, they used to breath it and it would get in the lungs. Killed a lot of horses. But that bug sure cleaned up the *Pamakani*.

MO: Yeah...above Ulupalakua...had that waterline trail yeah...once in a while we used to go see those guys check the line yeah? Especially when I was Pu'u Mahoe.

CSH: So when you were farming Pu'u Mahoe, was it all rain water...irrigate, no irrigate?

MO: Back then, we used to irrigate, but not that much compared to what farmers are using now.

CSH: I got to talk to Ed Hew? Do you know him? About Kēōkea...and he used to say it used to rain a lot back in the day. Was Pu'u Mahoe the same?

MO: Yeah.

BE: Pu'u Mahoe is right on a strip where it rains.

MO: You know the *Pamakani* was at Waihou ... used to be high as this I think (indicating chest high). And we had one bird dog, half-setter. If he track the bird and he went underneath there and he no come out...he following the pheasants yeah? You not walk; you crawl through because you cannot stand on top. And that dog is making noise following the pheasant, but now Ulupalakua look nice no more that *Pamakani*.

CSH: When I was talking to Eddie Hew he was mentioning about how somebody went up to the spring and tried to improve it but then the water went away. Did you know about that? Who that was?

MO: No. Everybody had this water come from Waihou. He have for his personal use...aside from the ranch. Now everything looks so different.

CSH: Do you know anything about Sun Yat Sen Ranch? Somebody said Sun Yat Sen had a ranch in Kamaole...how long did that last?

BE: I don't know how long it lasted but it was there...Haleakala ranch bought.

MO: My grandson the other time when he came back...I took him for a ride...like now it's nice roads and you can go with car...

CSH: Back then you had to go by horse...

BE: Horse and mule!

MO: Yeah mule. Sometimes the places you gotta go the mule is too short! But those were the good old days.

CSH: So you were in Kanaio only for three years?

MO: In fact I didn't stay out there the full three years because...

CSH: Where did you go after Pu'u Mahoe? Back here?

MO: Because my father got sick, and he wanted me to come back here, so I came back. Take care of him first. But now Ulupalakua all ... they no drive (cattle)...no more horse I think yeah?

BE: Did you know that Merton retired (Ulupalakua Ranch)?

MO: Merton retired? Who went take his place? That Merton I used to call him *hanai* boy because Ikua went raise him yeah? I haven't seen them in how long.

CSH: So plenty Hawaiians those days back in Kanaio those days.

MO: No the time we went only had Goodness...Sam Po...Peter Malino...just a hand full.

BE: Did you work for Kanaolu Ranch.

MO: No I never did work for the ranch...only for branding yeah? Old man Rice used to call ... tell me "Eh you go! We want you at the ranch!"

CSH: Is that how it was for a lot of people? They don't work for the ranch all the time; they go just during branding time?

BE: Mhmm. That's what we used to do. I'm guilty.

MO: The last big branding, when they had that...oh that day I made sure I take my plow horse. That day we had a horse from Parker Ranch. Big as he was but for...you riding in the pen he was always with his ears up.

BE: Big horse!

CSH: How come that horse...why your plow horse?

MO: Well my brother had one Kamaole Ranch filly and that Jocin he had one nice horse. They had this gray horse from Parker Ranch and the *haole* told Jocin why you no sell. But my brother was looking for one horse that you can use on harness. Those days, you farm with a horse; you plow with a horse, not like now. Every farm house you go you see one or two tractors. So my brother and Jocin made the deal. Only thing that buggah used to buck and slide! My brother went fall down two times. When you go ride...just when you throw your leg over the saddle, that buggah turn! Catch you off balance. That's why when used I ride I knew he had that habit, so take him to a high place. My saddle is higher so I hold that buggah and then he look his ears are (motioning that they were perked up) then I jump on top and pull the reign. Heavy as he was though...the speed he had. But now no can. Now I ride wooden horse! (Laughing) So where is your cattle truck?

BE: Still going!

CSH: I would like to ask you some questions ... I'm sorry I didn't...

BU: If I can help...I'm Bill (Uemura).

CSH: Are you from Kula as well?

BU: No, I'm an import from the Big Island, Kona.

CSH: Kona? How long have you been here?

BU: Since 1970.

CSH: Here in Omaopio?

BU: Yeah, right through. I married his (Mr. Otani's) daughter so at that time we decided we gonna come over here, rather than stay on the Big Island. So we built this house in 1971. So we've been here over 30 years.

CSH: So from 1970 to today you've been on this land?

BU: Right, I was telling Bill that first we lived with him then during those early years this area wasn't developed yet. In fact this home, Charlene's home, in fact most of the homes on this side of the road wasn't here except for his brother and Stanley. The rest was all empty. It was all ranch land, *kiawe* and *panini*. But since then it's changed, because there's a lot of homes now. He used to tell me that when they first moved here, this road (Omaopio Rd.) wasn't even here. There was a road, but it was more like a trail because horses could go on it and maybe wagon. But when they first started putting cars on to it, winter time when the rainy season came, the road was full of ruts. In his case he used to live up on the top where Harold lives and as he came down with his truck, during the rainy season, he wants to turn off to his driveway and he couldn't get in because he was stuck in a rut and you end up coming down and have to turn around and come back up to try to get in. It was that bad, then finally the county came through and improved the road way. And same to with the waterline. When he first came to live up above, in the first lot that he picked up in Omaopio, there was hardly any water. What was it? Half-inch line? Half-inch I think from that water tank area right above here. Just below that tank there was a valve that they connected the half-inch to and it supplied most of those people who lived below that tank. Including him and even those further down that farm inside the pasture area those days. So they had to share all that water, until the county improve the water system. So in those days, they used to say when they used to plant crops, and I guess in those days, the weather was more predictable? So they used to plant according to the rain schedule. And he mentions about the *panini* rain for this area. He says you can schedule your planting with the *panini* rain because that was pretty accurate in those days that it would come. And with that they could sustain their crop and at least harvest their crop at least to the end of the dry season. That signaled that it was rainy season coming back, you know that the cycle was back. But now days it's difficult to predict the *panini* rain because you don't know when it's gonna come. You know in the past

three, four years it's so dry, you don't see it. Yeah, originally, those that farm in this area, they had to depend on rain like that.

MO: Yeah, my two saddles. In fact, that other one my father bought from Manuel *inaudible* he work for McGibbon. Then McGibbon and Von Tempskey, my father was working for Von Tempskey down Kihei. Bought Manuel saddle \$20. He had that black horse. Every time one fly bite his shoulder, you no watch out, he scratch till the thing come all...but I used to ride him every day. But I make sure I no time him by one tree or to one post. Come home put grease on top...the he keep the flies away too yeah. Plenty folks wanted to buy my saddles...but no I get my two boys. In fact the last one I get, the rigging was old so I bought the leather...then the lining. That's why I tell my two boys don't sell that saddle keep em...eh...stay in the living room! Yeah we used to treasure saddles before. And like myself, I used cause I no more horse. In fact the ranches and branding, I go, I get my own saddle. I no care what kine' horse they lend me. So I fix em up, get little bit more to do I think.

BE: Merton's boy work Kanaolu.

MO: Merton's boy? I nevah know Merton retired. Old man Hua used to take him go work. That's why I call Merton my *hanai* boy.

CSH: Can you tell me what kine vegetables you used to grow out when you were living in Pu'u Mahoe?

MO: Oh...plant head cabbage...and then of course we used to go with the season yeah? That's why planting your commodity at the right time when you get yours, the markets are not flooded so you get better price yeah?

CSH: Your son-in law just told me about the *panini* rains of Omaopio. Was it the same at Pu'u Mahoe? Did you have predictable rains like the *panini* rains of Omaopio, was it the same.

BU: Remember you used to tell us that when you first moved to Omaopio and you started planting often times you folks depended on the *panini* rain to come?

MO: Oh yeah...*panini* rain. Yeah you know funny now no more that *panini* rain. You know what the *panini* is yeah? The red fruit and the white one. That thing all through here. Right across here, you couldn't go inside on horseback; the *panini* was all high yeah? And the cattle all used to be underneath. You only go so far with the horse, then the rest you follow the cows underneath the *panini*. And every year when the fruit coming in season, until then you see that *panini* half green, half red. But one good rain we used to call that the *panini* rain...that thing come and you look the fruit all ripe. Then they fall down and the cattle go eat that fruit.

BU: So grandpa, when you were farming by Ulupalakua, you folks could depend on the *panini* rain too over there? You folks had such thing or just Omaopio?

MO: Oh Ulupalakua...I never take notice of the *panini* rain, only over here. I guess that thing doesn't draw that much rain now like it used to, because we don't have that kind of heavy rainfall.

CSH: So Ulupalakua you grew only head cabbage?

MO: No, cabbage. I used to plant all kind of stuff, depend the time of the year in season. Certain stuff you cannot plant with too much rain. Head cabbage is the one thing you can grow year-round.

BE: What did you grow up Waihou? Cabbage too?

MO: Yeah...Waihou depending on the time of the year yeah? The season, when is the most suitable time. Irish potato...

BU: Any corn? Did you folks plant corn?

MO: No...Waihou, the people didn't plant corn. You plant just little bit.

BE: Chester Koga was up there too?

MO: Yeah.

CSH: So you planted potato year-round up in Waihou?

MO: No potato you go during the season too...

CSH: What did you plant during the rainy season?

MO: Oh all kine vegetable.

BE: The children from Waihou have to go to school...no buses or anything...they used to come stay with people. We had to girls come stay with us, my mother used to take care of them...they were from Waihou.

BU: If I think I know that Waihou area, where he showed us, that's kind of way up yeah?

BE: Oh yeah. I remember all those kids all had rosy cheeks.

BU: To walk to school everyday from there would be a problem yeah so it would be understandable to stay with family. But you know the thing that...well I guess it's the same even in Big Island...I just wonder how come the settlements were way high up compared too (today). Now we have irrigation, city line, and things like that but I don't know if it was because of the rainfall thing or what. The residential areas seems to be higher elevation, like Waihou, that kind of place...way up. Even in Kona, Kona was because of the crop industries...and the pioneering farmers tended to be higher elevation as compared to today's farmers. Today now it's all

forested...so you don't know...in your case you would know because you would see the terraces. But that's the thing that struck me when he took me up there, I said "Whoa, this far up?"

CSH: Did it snow, your time up there? Did you have snow?

MO: No.

BU: But the mountain had snow...on the top?

MO: Yeah on the top. We were talking, I wonder if going get snow on top that Haleakala? Oh but when that snow came up there, boy it's cold! I know one day I used to farm and go out construction work...you know that crater road from Pukalani up to Puniau...that's the first phase...I was 39 months working. That's why like, when completed that first phase then...in fact the day I went apply for work, early in the morning I went up to see the superintendent he said "You stay right here, tomorrow you come work." All that road, towards the end not like now all ready made sand...back then you scoop big kind rocks....

CSH: Thank you so much for sharing your stories with me.

APPENDIX D Interview: February 2, 2003

'Ulupalakua

Mrs. Nancy Purdy: *NP*
Mr. Daniel Purdy: *DP*
Ms. Carol-Marie Lee: *CML*
‘Ulupalakua, Maui
February 2, 2004

An interview was conducted with Mrs. Nancy Purdy on February 2, 2004 by Cultural Surveys Hawai‘i at her home in ‘Ulupalakua. Also present were her husband, Mr. Daniel Purdy, and niece, Ms. Carol-Marie Lee.

NP: I guess all the families that used to live over here are all gone. They all moved out. The young ones move out and the old ones pass on. So now we have all new people up here.

DP: There used to be plenty Japanese up here too.

NP: Do you remember they used to have that Wyler Station (up near the sky-line), that two-story house? There are new people living up there now.

CML: Does it still belong to the ranch? That property?

NP: I believe the person living there now is the one who is working here at the winery...sort of controlling it yeah?

CML: Managing?

NP: Managing ... just the winery.

CML: But Michael (Mr. and Mrs. Purdy’s second son) used to live up there?

NP: Yes, Michael used to live up there and then the Erdman’s wanted him to live down here. Michael wanted to fix it (the Wyler Station) up, but they said it would be better if he moved down here. So we talked about it and I said, “It’s better (down here), because it’s closer to work and everything else.” So he moved down here.

The Kanaio people, even the Mendez, are not living there. There are a lot of new people.

CML: One of the Uweko‘olani girls came back though, huh?

NP: Who?

CML: Margaret Uweko‘olani.

NP: Oh ... she used to work up here in Kula, then she retired and she lives in Kanaio now.

CML: She lives there by the church yeah?

NP: Yes, she lives there...and Body lives there ... Mendez. He is one of the sons whose father manages the winery. So he (Body’s father) lives here (‘Ulupalakua) and the son moved over in the grandfather’s house (in Kanaio). And who else do we know...the Uweko‘olani’s...Po‘aipuni’s...Sam....what is his name...

CML: Sam Po?

NP: No...

CSH: Sam Po is out in Kaupō right?

CML: No they lived Kanaio and then moved down...

NP: Yeah, you see that's going down that way (toward Kaupō)... Now his wife (Sam from Kanaio) lives there, because he passed. Do you know that man? And who else do we know over there...some *Haole* people yeah? They have nice homes out there.

CSH: And how is it out there? Catchments...lot of water meters out there?

NP: I think so. Everyone is supposed to have meters yeah?

CSH: But you were saying that when Kanaio pulls water...the water in here...

NP: Because it comes from that line (the project waterline) and goes on to Kanaio for the people who live there. So for those who live here in 'Ulupalakua, if they (Kanaio) pull the water, then we don't have enough water here. That was a complaint about this waterline.

CSH: So it's a good thing then, that they're increasing the diameter of the line.

NP: Maybe that's why they are going to fix it. You know, the line is so old, it breaks yeah? We have this right here (pointing to the waterline running to the house) and there would be holes all up this line. So Michael changed it, and connected to this one. I believe, under here (the buried line in the yard) we have a leak here and there. That's alright; we have water (laughing). Sometimes Michael complains, "Oh our water is so weak." I say, "Well, you probably have broken pipe somewhere."

CML: So this road (dirt road fronting the house) goes all the way up to the top?

NP: Mhhmm.

CML: Never used to before right?

NP: No...it used to go as far as the Chang's and that's all.

CML: Where does it come out?

NP: Same place ...

CML: Pu'u Mahoe side?

NP: Yes, you come around. The people who live above here (*mauka* of the house) come through this road.

CML: Who lives up here?

NP: I don't know their names...one of them are the folks who work at the winery and live in the two story house. Then there are new people that live above there (the Wyler Station). Used to have...what's his name? The Japanese guy who used to raise strawberries up there...he gave up though, because of the water.

CML: No more water?

NP: Yeah. He was good and nice to the people, friendly. That's the Japanese yeah? The Makimoto's live below there (*makai* of Kula Highway) and the Purdy's live below that. They all live on the Hapakuka side...do you remember?

CML: Going down the park road (one road up and toward Kula from the 'Ulupalakua lateral corridor) on the right side down by the Makimoto's and the Inouye's used to live?

NP: The road that went to Makena before? Well that house right there. And more *Haole*'s below that. So they are just waiting for the one day that they'll open that road, were Nakao used to live, and go across and come out through here, to Papaka. Do you know the road, the name of that place? Well, you come out through there. And they also made the road on this place right next to the school (the road where the 'Ulupalakua waterline will extend *makai*)?

CML: Yeah, that's Cahill yeah?

NP: Yes.

CML: That goes down to the property, the subdivision.

NP: And they keep saying, that's an easement. But that is no easement. There was no road at all there. The gate was open because there was one man who used to live there and they had the Japanese school. Do you know the Inazaki's? They had the Inazaki's Japanese School and the public school ('Ulupalakua School). So there was no road.

CML: Yeah, I don't remember a road from here down ... it was always by the park road.

NP: Yes, by the park...and the old easement is between...where Andrew used to live and the green house...Kaniu's now...over there. It used to go way back...then into the forest and out. You see where grandma's (Francis Wilcox) line is, the end of her land (*makai* of Kula Highway down from the ranch store), and then there was another wall, and that is how they used to go down. But dad closed everything up ...so they used only the park road. We had a road that used to go to that land and down to grandma...but that was no easement. The farmers just made that road (laughing) you know. Instead of going all the way down and all the way up and back out, they came through there. So that area was not for public people...that's why I kept saying that was only to go to grandma's place and no other place. But you know how it is, when new people come and buy, they fight and they make their own.

CSH: Is this the road that you're talking about aunty (pointing to the aerial and the road that the 'Ulupalakua lateral follows)?

NP: Oh...to here this is where Kanaio is?

CSH: No, Kanaio is over here this is coming down the road to Makena...is this the road that you are talking about? Cahill's road?

NP: I don't know....

CML: Maybe that is the road...

NP: Maybe...

CSH: This is a whole new road ... it's pretty steep!

NP: Where is this road from?

CML: That's the line, the waterline

NP: Oh the waterline.

CSH: Yeah this is the waterline and it's new in here.

CML: The road?

CSH: No the line.

CML: Oh that's right, because grandma's house was well water yeah?

NP: Mhhmm. You see, grandma's house, if you were staying there, the water that you would get comes from right here where the highway is, the meters are all there. Your mother (Carol's mother) did not take that meter off, I told her not to. She said she was going to close it because she said she paying for nothing. That's way back, before anything happened to her.

CML: I remember her talking about that, but I don't know what she did.

NP: I told her not to do that because if that happens, you know, if one of you folks happens to want to use the place, you are going to have to buy the meter over again and you are going to have a hard time to get it. A lot of people are having hard time getting water meters.

CML: Yeah, cost \$1200 now.

NP: It's not the money, it's just that...

CML: You gotta wait in line. I am not sure if she disconnected or not, because as long as you have water meter you get bills yeah? No more bill.

NP: You don't bill?

CML: No more bill from the water department.

NP: You supposed to be paying for the meter, that's why she said *pohō* money.

CML: I no think have, she took it off.

NP: There are so many meters over there (on the family property just off of the new lateral). I know Aunty Carrie has two, Uncle Nick has one, and then you folks are supposed to have one.

CML: And then Cahill. Who sold to Cahill, do you know?

NP: No.

CML: Get Makimoto's down there, but no more the old folks. Is Mitsugi?

NP: Mitsugi? He died. He and the wife. The brother's wife is still living here. I don't know if you know George Tarada? He's older than you.

CML: I only know Pearl.

NP: Pearl! Well, Pearl's mother is still living. Okay now, the Makimoto's, the wife works at the store (ranch store). She probably knows more of the people down there, the new people who are living down there. And who else, the Hapakuka's live over there too. I don't know if you can go down to this road (the Cahill road), if no one paid for the road going down. You cannot go through, when they build something, they own it, and you have to pay for that! Wow, what a life now days yeah? No free time like it used to be. And whether they had the rights to put the road there or not, that's their road and they are going to do it!

CML: He had a little hard time with the ranch. Insurance wise and stuff like that, because it goes over ranch property, he had to provide some kind of insurance, certificate of insurance so that they (the ranch) are not liable...oh...here comes somebody.

NP: What they wanted first was Erdman to fix the whole road...all the way down...from the park down. Erdman didn't want to because it's going into the ranch property. He closed the road that they always used and he closed Makena Road...you know Makena gate? Too many people, you know tourists and everybody else that went down that road. There was no problem when we were using the road, the local people here, there was no problem. But later when we started having all these tourists and everybody else came ... well who ever used the road going down that way, the road was never maintained...so if their car broke down, they were going to go after the ranch because that was ranch property.

CML: Yeah, the county used to maintain the road.

NP: Yes. And now they won't.

CML: That was because the school closed too.

NP: It's just that the mayor ... while they were still had that road, he said, "No." He 30 days, one month to build it, if he's wasn't going to improve it then he's (Erdman) going to close it. And that's why he put the fence up there. And that was Hannibal Tavares. Elmer was smart. He waited until just the halfway of May, then sent the man up to fix the road and the road stayed open. And when Hannibal took over, he said no and he made it no! Then the road closed. So now we have a hard time yeah? If we want to go to Makena we have to go all the way around to Kihei and out to Makena? That's a long drive. But there's a...Erdman has a road here, that takes you out to....that place in Kihei? No.. Maui Meadows.

CML: The tech-park.

CSH: No, no...Maui Meadows, right before Wailea.

NP: You know where Eddie Brown lives? They have a road down there that goes through and you come out through Maui Meadows. So it's only the ranch people that use the road because they have the key. Like Michael them, if we go down this way (using the old road to Makena) we can get down to Makena like that! 10-15 minutes. Other than that, not everybody can.

CSH: So Aunty, you were born and raised in 'Ulupalakua?

NP: Yeah! (laughing)

CSH: Can I ask you what year?

NP: Oh yeah, 1920.

CSH: So you spent a lot of time up here?

NP: Oh yes, all my life! I married this guy (Dan Purdy) and I got stuck here! (laughing)

CSH: When did you marry that guy!

NP: Oh when I marry that guy...1940.

CSH: And Uncle, you from 'Ulupalakua too? Were you born here?

DP: No, Big Island.

NP: He was born in Waimea.

DP: Up the mountain.

NP: And when he was five he moved here.

CML: Okay, I have a question, Uncle, just to make straight in my mind...Ikua, the cowboy? The world-famous cowboy? He was your father or your brother?

DP: My father!

NP: Yeah...a lot of them ask us too. Who is Ikua? Is that his brother? No...that's his father. I don't know why the people think that he's the brother.

CML: That would make him (Ikua) younger than what he was.

DP: When he was world-champion, I wasn't born.

NP: Oh yeah, you were still in the dark, trying to get out! (laughing)

CSH: I did a walk through up there. I went with the county, and I did a walk through of the waterline and we saw some rock piles, piled up rocks...you know the man-made kind. Do you know if there were Hawaiians living in the area before?

NP: Oh many Hawaiians yeah? Before the Baldwins yeah a lot of Hawaiians. But you know all rock piles, something like that (pointing to a mound in the pasture). Used to have farmers up there, farmers. They used to live up there and farm the land.

CSH: Hawaiian farmers?

NP: No ... Japanese. And that's why they build those things, you know when you clearing the land, there's a lot of rocks.

CSH: So the cowboys didn't do that?

NP: No. The cowboys make stonewalls! (laughing)

CSH: But plenty Hawaiians before the Baldwins?

NP: Oh yeah, especially Kahikinui side, a lot of Hawaiians ... Kanaio. It was only Hawaiians around there. The Japanese, they just farm, and when they clear the land, they move over here. From here they move down grandma's place and then they move out. You know, the family got older, so they all move out. Actually, when they have the Japanese come, it's only to lease the place to clean the land. You know? To clear up the land then they could use for their pasture, the lease is over, they have to move to another area. That's how the Japanese used to live before ... and they build their house and when they done, when the lease is over on this space, they have to tear their house down and take all their things together to another place, and rebuild it. The way they build it is where it's easy to take it apart.

CSH: Like a mobile home?

NP: Mhhmm. And then, you know it's really interesting when you think about it, because their homes, when they build they have bedrooms and living rooms. But not a kitchen. When

they have parties, they take the walls off, and the whole living room and the bedrooms are all a party room ... it's like a hall yeah? And when their party is over and everything, they put the walls back and all the family sleep in their room. And their kitchens were dirt floor, and they build their own stoves, wood stoves yeah? They build their own stove and they cook right on the fire.

CSH: What about the Hawaiians that used to live here? Did they live pretty traditionally Hawaiian?

NP: We don't know the Hawaiians, I don't think Uncle know too. He probably came when they were gone. They probably all mostly that way (east, southeast) he know s a lot of Kaupō, Kipahulu people. I mean Kahikinui.

CSH: Is he herding the cattle with a ...(looking into the pasture fronting the house)

NP: Four wheeler.

CML: All-terrain vehicle.

CSH: ATV, that's it.

DP: He's loading up.

CML: That's cheaper than a horse. Right Uncle?

DP: On a bike motorcycle. You see it? It's over there.

CSH: I was talking to Bill Eby? And he said that up here, it used to be covered in *pamakani*. Is that a native plant?

DP: It's all gone, no *pamakani*, I no see nothing, it disappeared.

NP: I think so (the plant is native). That's the kind of job they had when they were young, like 12 and 13 years old, Uncle Nick and them, your dad (Carol's), Uncle Frank. Summertime, they used to go and dig all those *pamakani*, clear up the land.

CML: What is that, *pamakani*, is that a vine?

NP: No, no, it's a plant. It has white flowers. I think I used to see in Kula, I don't know if they still have it, if they poisoned them.

DP: See the bike? (Driving cattle) Two of them.

CML: Is that a bike ... no ATV. **DP:** No it's a motorcycle.

CML: Yeah, it looks like a dirt bike

NP: Somebody rides a motorcycle, uh Alec, Alec ride the motorcycle.

DP: Michael rides.

NP: Michael, not dirt bike.

CML: Motorcycle though.

DP: They use the motorcycle to drive the cattle.

CML: Oh my god! This modern cowboy!

DP: There's a dog... to help them too. You see the dog way down?

CML: Oh there's the dog ... and two motorcycles...no one and two ATVs.

DP: You see the two guys?

CML: That was the highlight of living in Makena back in the old days. When you folks used to bring the cows down to the cow pen by the landing for branding? I remember John Pana used to bring ...

CSH: They used to bring the cattle all the way down to Makena to brand?

DP: Not anymore!

CSH: Have you noticed a change in the rain? The rain patterns over here, is it drier than it used to be back in the day?

NP: Oh yeah, last year we had it real bad. But the people...had more rain way back...the growing days. Yeah.

CSH: Do you know of any plants up there (up the mountain) that Hawaiians used for medicine?

NP: Mhmm. Yeah they have, like the 'ohelo, ohia. I don't know what else they have up there but I know I used the 'ohelo for tea. That's where they can find it is up in the mountain.

CSH: And you use it for tea?

NP: And also, you know the *lehua*? That too. The *lehua*, and the 'ohelo, and one more is the *ihi* over here. There's three kinds that we use for kidney, to flush the kidney. Like for instance...the first time we learned about that. The *ohelo* I was using for myself because his father (Uncle Dan's) said. I got sick after Danny (eldest son) was born and I went to the doctor but I couldn't stay in the hospital because I have a baby...so we stayed with grandma. And then his father told uncle to go and get 'ohelo leaves and boil it and drink for tea and that would clear my kidneys. It did help. And ever since I always used it...you know every now and then I would use it. Cause it's good because it helps me, I figure it helps me...you know maybe up here (tapping the head and laughing). But anyway, I take that. There is also *ti* root for bruises and swelling. Plus we have *mamake* all over the mountain too yeah?

CML: Don't say that (pointing to the tape)! (laughing)

CSH: Too late now...

NP: All in there already!

CSH: What was the *mamake* used for ... tea?

NP: For everything, it's for everything yeah?

CML: The *mamake* you cannot take too much but, because your blood pressure goes low.

NP: Yeah. I can say something about that with myself, but I not going say it (pointing to the tape).

CSH: So Auntie, how long has the family, been in 'Ulupalakua?

NP: What family?

CSH: Your family. Grandma Francis. From how long?

NP: Way back.

CML: Was great grandpa Slocum here?

NP: Was here. Yeah.

CML: But he was a grown man already.

NP: Who? Slocum? Wilcox? Not Slocum, Wilcox, Slocum was his wife. His wife came from the Slocum family, he was from the Wilcox family. It was from way back, over 100 years. That was way before the Baldwins came here. I think it was still before any other, Makee.

CSH: Von Tempskey?

NP: Oh Von Tempskey is way later; we see them with the Baldwins. Yes, he and Torbert were the two that were over here. But he sold most of his share of the land to Torbert. He kept the one down there (*makai* of the road) supposed to be one more here and supposed to be up the mountain. And one below, where right now Seibu has, towards that place.

CML: How did he get all that property?

NP: I, well...I don't know. Maybe they just come here...I know Torbert was a surveyor....not realty, realtor, that's what Torbert was. So he get to know about the land, which one is open, where they could have it. I don't know how they get it, whether they buy it or they just move in and own it.

CML: Did any one of them have any connections with a bank?

NP: I don't know.

CSH: So William (Slocum Wilcox) was the first to come to Maui...

NP: From his family...

CSH: William Wilcox.

NP: And he married a princess from Lahaina, they moved to 'Ulupalakua, they were living up there somewhere in...where is that place? Eddie Brown? Upside of Eddie Brown...Honua'ula. That's why he is buried up there on the hill, he's buried up there.

CSH: Which hill?

CML: Is it marked? Is it a marked grave?

NP: Yes! Grandma showed may where the grave is and I remember they have two lilies on the side ...

CML: Is it by the store?

CSH: Someplace down there (*makai* of Kula Highway).

CML: By the park?

NP: Yeah, across the park on the hill. Ke'eke'ehia.

CML: Oh, that's below the polo field.

NP: Yeah, used to polo field, then they have rodeo field, where Kamoia used to live.

CSH: So he and his wife are buried there? Or just him.

NP: No, just him ... I don't know where his wife is buried. I went to Lahaina, I went through all the graves looking for her name. I couldn't find it.

CML: What is her name?

NP: Ahh...Kalua.

CSH: And they had your grandpa?

NP: Yes, they had grandpa (Edward), Charlie, Robert, and Richard. Then the girls were Caroline, Nancy, I think that's all. And then he had one with another wife...when his first died yeah? He married her and had one more. And that's Annie. I don't know if you know Tommy Kahiona, he used to teach Hula. Kahiona is Uncle's have brother actually.

CML: Uncle who?

NP: Nick. Uncle Nick was adopted by my grandpa.

CML: Uncle Nick's mother is grandpa's sister?

NP: Sister, half-sister yeah? Annie's son, from another person. What is the name? Captain Long. He (Uncle Nick) was such wonderful man. I never saw a man like that...he helped grandma (Francis) so much, he never had anything, you know when he wanted to go out, he had nothing. So he had to ask, and I remember I used to do house cleaning and baby-sit, so I don't spend my money...where am I going to spend my money...so I kept my money. So when he asked grandma, grandma says to go ask Nancy. He asked me for one dollar, I gave him five dollars.

CML: He got married late in life.

NP: Yeah he did. But never, not once, did he ever say that you kids owe me. Never turned and ask us for anything. That's why I said he was the best Uncle in the world!

CSH: So your grandpa was Edward Wilcox? And he stayed in 'Ulupalakua?

NP: He grew up here. (Unnoticed, the tape ended here. There was further discussion that Edward met and married Alania Pi'ianaia and settled in 'Ulupalakua) They look old those days. And grandpa was all gray.

CML: Was he a judge at one time?

NP: Mhmm. Over here and Makawao. We had a court house here, by the school grounds. You know where the corner of the place is, you remember the post office? When your mother (Carol's) was working at the post-office?

CML: I only saw pictures...

NP: Anyway when they had that building, just below that. And then I guess he had to go to Makawao too yeah? And they traveled by horse you know. All horseback. He would go to Makena afterward...he would go to where they were living, the house where we grew up, where there was a long porch with a little room, and that's where they had the post office. Makena post office. So he went to Makena on a horse, pony express, and brought the mail up.

CML: I didn't know there was a post office in Makena.

NP: For a long time, it was going as Makena post office. Even when it moved up here in 'Ulupalakua, it still was called Makena post office. So then later, they changed it to 'Ulupalakua...way later, I think we were already married, 1940, 1950, somewhere around that they changed it.

CSH: So Grandpa Edward stayed and lived his days out here in 'Ulupalakua, and had your mom, Grandma Francis (Wilcox).

NP: Yeah, she too. She got married, raised all her kids, 12 kids!

CSH: How did she meet her husband?

NP: Everything is horseback! So she says, she and her cousins would go and ride, go to Wailuku all on horse. Then, they had to go from Makena to Kihei and out and that's how she met them. Met him.

CML: How, what was he doing?

NP: He lived in Pu'unene.

CML: Wasn't he Luna in the plantation?

NP: I think so, I don't know, he and his brothers all work there. But not for a long time because after word he work on the road, cleaning.

CML: So she meet him when she's going to Wailuku?

NP: Yeah, on the way home, she said, one day on the way home they were coming home and these guys they rode horse too. And I guess these guys, they always saw them come by yeah? And they had plan, he and his brothers. So he won her.

CML: He won her? How?

NP: The other brother wanted her but this one got her instead...John (DeLima).

CML: And his brother was...

NP: Joe

CML: Oh Joe from Kihei?

NP: Yes!. You see they used to chase the girls and catch the bridle. I say, you know it's dangerous. So all that time that was going on, he wanted to marry her, my grandpa didn't want it to happen but anyway they got married, and she had 12 kids. Lucky we have grandpa's place, we can live there and raise all the vegetables, the animals, and everything to eat. We had everything, cows, and milking cows, and pigs, and chickens ... you name it, we had it...on the farm. We all worked hard ... ever since you were little, if you walked then you could pick up a rock...so you work. It was good. I don't hate it. I learned a lot. By growing up in this kind of life yeah? So my children had a little bit of a test about those things. I tell people, that's why we are what we are because we grew up in that kind of life and we never learned anything that was not nice.

CML: We were very naïve.

NP: I used to say innocent. We never came up to this side a lot. Most of the time when the farmers were still there we were around them, we had our own games, our own times, so it never bothered us about this side of the country. It was all down there (*makai* of the

road). But we had a lot of fun, they come night time, visit, we play cards, there's cards, midnight (comes) great-grandma gets up, she stops playing cards with us, she goes in the kitchen, picks up food, and it's like having a full meal on the table, "okay everybody, come eat" and everyone's like, full the table and eating. Our neighbors were there too yeah? Come over, we get music one side, card game one side, and whatever the next. Grandma was always nice about that because I guess she grew up like that. Our life was really different from this side life yeah?

CSH: And then when did you meet Uncle Dan?

NP: Uncle Dan? Yeah?

CSH: How you guys met?

NP: Uncle Dan? Oh with that kine people, you can never run away! (laughing)

CML: So he went catch you too?!? (laughing)

CSH: He went snag the bridle from you?

NP: Oh...they don't give up until they get what they want!

CML: That's how the men were back then yeah?

NP: Yeah. They don't care how old you are, if they want you, they gonna go until they get you (laughing). But when they chase, like when they see the cattle, that's a good one there and I'm gonna get it! Once, someone came to interview and she says, "Oh, it's good yeah? Marrying a cowboy. " and I says "No." She says, "Why?" I said, "Cause they think that you are when of them in there." (nodding to a corral) (laughing) In a way, I am glad that I'm still here, in here ('Ulupalakua) because I think I've had a better place to grow up yeah? Bring up my kids...even you kids grew up in a good place.

CSH: Aunty Carrie had a lot of your family records too? No?

CML: That's only ...

NP: Wilcox ...I don't know anything about John DeLima's side.

CML: There is some information because I found his other brother...starts with an M?

NP: Manuel?

CML: No.

NP: Marion?

CML: Yeah, his granddaughter, I met up with her and she dances for ... know my former *kumu hula* very well. So she had some of the information. She had the ship's log that they came over on. That side, she had that.

NP: And you know her, so if you want any information you can go get...in fact, you should go get it now. So must be Uncle Marion got all the stuff yeah? That's why, I ask these other DeLimas ... they don't know. Now they have only Abel, the rest are gone. Arthur is the one, no Marion ... had a Hawaiian wife...she was something. She's a good timer, she loves her drink. They stayed with us one week, holiday, Christmas to New Years. It was something that goes between her sister and her, they were staying with the Na'auao's. Her sister was married to a Na'auao. So they were living down here.

CML: Yeah they all had property down here yeah?

NP: But they sold, they sold, but they kept the grave.

CML: Did you know a Napokā?

NP: Napokā? No.

CSH: So how long have you been on this side?

NP: Fifty-six years, right here, in this house. But we had been moving one house to the next.

CML: Cause I only remember you here.

NP: Yes we were already here when you were in Makena.

CML: Cause I'm 55 yrs.

NP: You are 55? Okay, Halulu is 56 no...we were here longer, we are 58 (yrs) here because Halulu was just making two years old when we moved here.

CML: Where were you folks before.

NP: We were in a house over here (to the side), no more the house now, it's where Merton had his pig pen. You know when you go down? You weren't born yet. Then we move to the other house.

CML: Uncle Johnny used to live over there too yeah?

NP: That house, that was our house first.

CML: And then you moved here.

NP: Yeah, because we needed another room...had more sun yeah? It was a lot of life of work and stuff. Sometimes I sit back and think about how they were growing up and how I managed with these kids...and when they played football...and that was really...I had to go to work, come home, get the girls, get supper ready, then I had to get in the car, go to Maui High to get the boys.

CSH: Where did you work?

NP: Oh I was working Kula.

CSH: Kula San?

NP: No...I didn't work in the hospital. I don't want to work in the hospital, maybe I do some housekeeping ... I get, I feel sorry for the sick. And then I bring the children home and 10:00 pm I go back to work, I do private nursing. I work at the house, that's the kind of work I like. You don't see all the patients yeah? I work until 6:00 in the morning, then I head home pick the boys up to the bus and back to work. I had crazy hours...crazy kind of work. In the day, I do housekeeping then 10-11:00 at night I go and do nursing. I like that kind of work because I can spoil the patient. If you have too many patients...turn 'em over then move on to the next one...too many yeah? I just want one or two...you give more time to them yeah?

CSH: Did you and Uncle retire about the same time?

NP: No, I work until I was 72. Of course that's different already, after 65.

CSH: Whoa...me, I like retire right now!

(laughing)

NP: Nothing else to do, might as well keep working.

CML: And Uncle retired how long?

NP: You retired what...

DP: I forget already.

NP: Twenty something, thirty something...

DP: Twenty years now. I'm 84...

NP: He's 88 (yrs) now, he retired when he was 64?

CML: Eighty-eighty?! You not 84...Uncle you made yourself younger!

(laughing)

NP: That's what I said, even the other day he said he was 84! (laughing) He's just one year older that me...84!

CSH: Uncle, when you were working for the ranch, were the Erdman's running...

DP: No.

CSH: The Baldwins were still here...

CML: The Baldwins where here when I was going to school, the Erdmans didn't come till after I left, went to Kamehameha School.

DP: This guy, he's just as good.

NP: Yeah he's good.

CSH: So what do you think about the waterline project? You think it's okay? Them replacing the waterline...

NP: I think they always had a waterline up that way huh? They call it skyline? It runs across there?

CSH: Yeah it runs across, past the strawberry patch...

NP: I saw the waterline, these people used to go in...we all use that line, from that line, and we get our water down here.

CML: So all they gonna do is replace it?

CSH: Improve it, replace...

CML: And add more laterals?

CSH: Well, that lateral coming across and down that road...the Cahill road I guess? They gonna extend the lateral down there and there's one more lateral over by Paeahu. Got the Paeahu lateral coming down to the corral right here off the road and then Kama'ole...Kama'ole tank is right here and ends at a bunch of houses.

NP: That's where it is coming down to here huh?

CSH: No, no that one is on this side (showing aerial)...coming down to here, behind Erdmans house and down I guess this new road to reach this place down here.

NP: Now when it comes this way isn't it this the one that comes across right here? (Pointing toward Kula Highway)

CSH: Right here? No, no this is the your road, this is this corral right here...

NP: That's Kula Highway...

CSH: So then it's gonna come down past that road, past Kula Highway, and all the way down and should hook-up.

NP: Oh...it's down here. Makimoto's side I think.

CSH: And I guess this is the old road to Makena, then it hooks up over here.

NP: How they do this? Because the line that takes care of down here is....

CSH: This line up here by the strawberry patch?

NP: Yeah, but it's right by our road here, we have one line that goes across, that goes to Papaka and all that I think yeah? Makimoto's.

CSH: And then this one that you refer to as skyline is going to go all the way across and past Kanaio.

NP: Straight over to Kanaio and this come down. Kanaio road, this is the Kanaio road.

CSH: So yeah, that's the project, and they just gonna improve...make the pipe bigger.

NP: Make bigger pipes.

CSH: So we were wondering too if anyone has any concerns...

NP: And you going up there? And what is this, a trail? (Referring to dotted line delineating an alternate alignment in Kanaio)

CSH: This is an alternate alignment if they have to move further *mauka*.

NP: Oh instead of follow the line, you going move up.

CSH: Mhhmmm. So what people get concerned about yeah if people knows of anything that would be disruptive by this project.

NP: Mhhmmm. Now this Kanaio road goes up to Kanaio?

CSH: They don't show the main road that goes to Kahikinui.

NP: Yeah, Kahikinui and Kaupō and all that. That's the road go around the island. Hmm...

CSH: Do you know the name of this *pu'u*? Above Pu'u Mahoe?

CML: Isn't this Pu'u Mahoe?

CSH: No Pu'u Mahoe is down here.

NP: This is the skyline...

CML: Gotta ask Michael...

DP: No *sabe*.

CSH: You throwing me off with the Spanish.

NP: Pu'u Mahoe is not below the road huh? It's above...

CSH: This is Pu'u Mahoe right? (Pointing to *pu'u* below the skyline).

NP: Yeah...this is skyline this is Pu'u Mahoe. Maybe that's where went and one time rode horse? We went down and they have a big, big hole, not hole but a you know...and the road, the trail was like this and it's a drop and the hole is right here, beautiful that place.

CML: Aunty, I never saw you on a horse....

NP: Me? I used to ride a lot. Every Sunday we used to go ride! Every Sunday we used to go after church, maybe some teachers wanted to go...and he gets Kane and Kimo and they all go riding with us. We go all the way around the mountain, down to Keoneo'io and come out.

CSH: So when you were riding around up there, did you ever come across *heiau*..anything like that.

NP: If you ask me about a *heiau* I don't even know how it looks like.

CSH: Big rock platforms...

NP: No. Only that kine (clearing mounds). Some people, these young people, they talk about *heiau*, they see like that (clearing mounds) and they think that's one of them. I said "No! that's man made!" Like down here, they have a lot like that on the side...where the Wilcox property was, the Evan's? Have a lot like that. When the farmers come they pile a stone here, a stone there. They clear the rocks. So (now) they think oh that's *heiau* or that's something *kapū* or something like that yeah? So I told them, no that's all from the farmers! I said, "We made some when we were kids. Picking up rocks and piling them up!" you know great-grandma's so I said "That's all farmers made this rocks, that's no *heiau*!" Aunty Carrie the best! You know the stone house? Inside the stone house she says there's a *heiau*! And I told her how can they put a *heiau* in there and somebody's living in there. I said, "The family lived in this house! How can that be a *heiau*?" But she argues and I don't say anything.

CML: So it's the Evan's that bought that house?

NP: The Evan's property, he bought it. He's nice though, he's a nice person...haven't seen him for a long time.

CSH: Thank you, thank you, for taking time out of your day Aunty!

APPENDIX E Interview: February 2, 2003

'Ulupalakua

Mrs. Alice Alo (Po): *AA*

Mr. Clarence Alo: *CA*

‘Waihe‘e, Maui

February 16, 2004

An interview was conducted with Mrs. Alice Alo on February 16, 2004 by Cultural Surveys Hawai‘i at her home in Waihe‘e. Also present was her husband, Mr. Clarence Alo.

CSH: So all of the sites in the Kanaio area are pretty much marked then?

AA: Some of them. As of now, I cannot tell you that where the pipe goes and in or where the other people gonna have a hook up or bigger pipe because there’s more homes out there now. So that’s the part I cannot just tell you where. I might say the wrong thing or the wrong place and tell you it’s over here and over there.

CA: There’s a lot of new people that they don’t know.

CSH: That’s what Aunty Nancy said, there’s a lot of new people now.

AA: Yeah too many! Like my dad (Sam Po), because of what he was doing with Bishop Museum, I used to go with him before. I know of certain places...

CSH: Can you tell me a little bit about yourself? Where were you born?

AA: I was born in Kanaio and raised in Kanaio. Then my father was working for the county and he retired. He was a fisherman, so he had a place down in Keoneo‘io, which the call La Perouse. He had tents there, so weekends we used to go down ... because my older brother was working at ‘Ulupalakua Ranch and we would stay home (in Kanaio)...and on the weekends we would go down and stay with my dad. So he was living down at Keoneo‘io for a long, long time. Then we still had that home in Kanaio. All of us children were born there, except the last three; they were born down here (Paukukalo). That’s when we moved from Kanaio and Keoneo‘io to Paukukalo.

CSH: And when was that?

AA: Oh! When was that ... that I don’t ... we married 43 years ... hmm...

CSH: Would you mind telling me what year you were born?

AA: 1936.

CSH: Did you attend ‘Ulupalakua School too?

AA: I graduated eighth grade and that was it I never went to any other school. Couldn’t because I was the oldest girl I had to stay home and help my mother them. But my brother below me he went to Kamehameha and he graduated from there and he works at Ah Fook’s Supermarket (in Kahului).

CSH: Still?

AA: Still yet, he was working construction with Iggy Construction and then he got hurt, couldn’t go work construction, so he works at Ah Fooks, and his name is Greg.

CSH: Can you tell me if you lived traditionally Hawaiian back then?

AA: Mhmm. We had hard times. Well, we raised most of our vegetables like that. A little garden that my father planted. A lot of sweet potatoes and pumpkin like that. My father was a baker and the only thing he would buy from the store was flour and sugar. That was the biggest thing he bought from the store. It's no such thing as candy, or ice cream, or bread. They used to have it in big buckets, you know? He used to buy it by the bucket. And then we used to go to the slaughter house, you know when they slaughter cattle. We used to get the tripe from there. You stay at the slaughter house and clean it and then we take it home and my mom and dad cook it. The chickens, we raised our own chickens, we had our own eggs ... we had ducks. But I don't eat the duck and the chicken and the egg because we feed it! We were the ones to feed the chickens and the ducks, and when my dad killed it...I cannot eat it! Because I was the one that used to do it and I couldn't eat that. And my father used to bake bread. Those big barrels with the cover? He used to bake for three homes. The Campbells below, and us, and the 'Uweko'olanis ... we used to give them bread. It was hard, hard life. And my father used to go fishing ... and he'd come home with fish. He used to take and sell. Most of the time he used to give to his friends in Kula. And he ends up drinking and come home, no more money...they give him food things though. They give him a lot of food things. My father was a heart man, too big hearted. He used to give to his friends in Kula. Instead of selling the fish to get the money, no he would give them the fish. But that was hard life, we had hard life.

CSH: How did you deal with the water out there?

AA: Water was okay with us. We had no problem with that. Those days hardly had much homes like now! We take a ride on the weekend sometime, oh the homes coming up all over the place. Sometimes I wonder if those people really own that property they have their home on. Or they just go there because it's empty and they build. I don't know...but before was only three families, only three in Kanaio. And up in at the radio station, although had two homes, but had *haole* people living up there. But in Kanaio, was only three. But it has gotten bigger. Go up toward the mountain there's a lot of homes up there, then going in to Kahikinui there's a lot of homes. So I guess they need a bigger pipe for water.

CA: This pipeline is gonna end in Kanaio? It's not going any further than that yeah?

CSH: Yeah, it's not going to continue on to Kahikinui.

CA: From there on, Kanaio, there's a lot of homestead...

CSH: Yeah, no, the folks in Kahikinui I think they're relying on catchment and fog drip. Do you remember if it rained more back in those days?

AA: Not really.

CSH: It was dry.

AA: Yeah. Actually we don't know when it was going to rain.

CSH: So it wasn't predictable, like in Kula ... they used to call it the *panini* rain over by Oma'opio.

CA: That actually is lower part of Kula...say below the highway. That's where most of the *panini* grow anyway; on the way going down Makena ... I don't know if you remember the old road going down from 'Ulupalakua to Makena?

CSH: I do remember it; my brother was involved in an accident on that road.

CA: Yeah because that's the way that we used to go down to from Kula until they closed it ...that old road. But that's the first time I hear you say that *panini* rain.

CSH: You know Sadao Otani?

AA: Yeah! From Kula yeah?

CSH: Yeah, he would talk about it.

CA: They down there yeah? Pulehu? That's the first time I hear of that *panini* rain, but maybe that came in where they live. I lived by the sanitarium. That's how I knew your grandfather, used to work Kula Sanitarium.

CSH: So Kanaio water was not predictable at all? The rain?

CA: Yeah, I don't think folks lived...very few people lived there. The ranch used to take care of their own water for the cattle. The biggest landowner at that time, when she was talking about those three families, was Guy Goodness he had a lot of land, I don't know if he still has it yet. Most of the land we couldn't get too where they used to live was Guy Goodness land. I remember this pipeline is way above Kanaio, you know up in the mountain!

CSH: Yeah, need a four-wheel drive to get up.

CA: Oh yeah!

CSH: Can you tell me a little bit more about the farming of the area? So was it mainly sweet potatoes and pumpkin?

AA: That's at our place, where we used to live.

CSH: Other folk might have...

AA: They had a lot of sweet potatoes growing and green onion was one of the things, and tomatoes. And they had mango trees grow in their yard and loquats. But the Uweko'olanis, they hardly had garden, the mom used plant just little patches of sweet potato and my dad used to supply them with a lot of things to help them. Even the Campbells. My dad was a midwife you know. When ever they would go have a baby my dad would go help them. All the kids would come up to our place, and when it's already done, cleaned everything all done we would stay by the hill in the front of our yard...and my father would tell the children to go home it's all over with. Same like my mom, when she was to have a child, we would all go down to the Campbells and we would sit by the cistern, you know a *punawai*, and we all sit

there and wait `til my mom would have a baby and my dad would clean her all up then he would come in the front and call us to come home. And the same like the 'Uweko'olanis he would go help them... but not all of them.

CSH: So most people were born *in* Kanaio? They didn't go all the way to Kula San?

AA: Yeah.

CSH: What about Native Plants in the area? Were there any Native plants in the area that folks used?

CA: Have *lehua* ... and *kukui*.

AA: Yeah, *lehua* ... that grows in the lava? They have quite a bit of that up there.

CSH: What did folks use the *lehua* for?

AA: Haku lei. My mom used to make. In fact when it comes to May Day, she used to make when we go to school and give to the teachers. `Til day I still go up back up there.

CA: You know, what Kanaio was noted for before? When we were small we used to joke about it. I don't know if you know what is *pamakani*?

CSH: I don't know what that is, but I have heard about that this whole month.

CA: *Pamakani* is not a native species. They thought, whoever brought that here, they thought was good for cattle. In a way was alright, but if they eat too much it was no good, they die you know. It didn't affect the cattle as much as horses, if the horse ate too much of that, they wouldn't last long, they die, they get sick and die. So that's the reason they call that *pamakani*, but it was brought here buy the Mexican or Spanish people, that's not a native plant.

CSH: So what does that mean? *Pamakani*?

CA: I don't know really. And then the lantana. Before, you go Kanaio, that's all you see, *pamakani* and lantana. But now I guess they brought in some insects to eat and now no more hardly any of that plant there. *Pamakani* used to be the main thing in Kanaio. You hear a lot of people talk about that?

CSH: Yeah!

CA: Even in Kula even part-way down to Makena used to be loaded with *pamakani* and lantana. And that is not a native plant to Hawai'i, it was brought here just like the *kiawe*. You know *kiawe* was brought for feed for the cattle yeah?

CSH: I didn't know that!

CA: Actually that was brought here for feed. You know the beans? The cattle and horses too, they like that! Even the pigs, they like that. I know people from the country, like Makawao, all those ranchers; they used to go Makena to cut *kiawe* for fence posts. Because the wood, yeah, last long. That's another thing they found out *kiawe* was good for. But you know, in time to come, I think *kiawe* trees are gonna

disappear. You take Kihei, all the way going to Makena used to be all *kiawe* trees. Now get all houses, hotels.

CSH: I know! Honolulu, O'ahu, they have no *kiawe* trees!

CA: Oh yeah! Before at one time, when I was in the army in Honolulu we used to go down Nanakuli side, we never used to take charcoal, we used to take *kiawe* wood because wasn't populated as now. Used to have *kiawe* trees. There's a lot of things in Hawai'i that as you get older you realize that that's not native to here, in other words was brought by somebody else. Before in Kula, I remember used to have all plenty Chinese people...

CSH: Were you born and raised in Kula?

CA: No, I was born in Wailuku and raised in Kula. My dad used to work at Kula Sanitarium. That's how I got to know your dad, because he used to work up there...you grandpa...Abner.

CSH: So you know Eddie Hew?

CA: Yeah, we call him Ah Fook, that's his Chinese name Ah Fook. But actually, he's not pure Chinese, he's Chinese-Hawaiian. He's married to Blanche, I don't know if you met her. Originally her name is Pang; she's another part-Chinese. How are you, how long you been with this? This connected with the county...no?

CSH: Mhmm. We got the job for this in November.

CA: You know, now when they do anything, they have to do a study yeah? Maybe it's gonna take years but they gotta protect themselves that's why they do all this thing. But I don't see why it should be any problem because all they gotta do is follow the old pipe already. I think in Kanaio if I not mistaken there's about two tanks, water tanks, two or three. There's one you can see it from the road and all you gotta walk up, you gotta use a four-wheel drive. I know there used to be a green tank up there. I don't know if it's still green or silver. You know, try to contact Eddie. Quinabo that's her brother.

CSH: So you still go in this area and gather *lehua*? Up high in here, up at the top?

AA: Yeah, *a'ali'i* and *lehua*. The upper road, not the lower road, but the old road. That's where I go up. I'm familiar with that road, that's where all the *lehua* is at yeah? And then, they have *a'ali'i* they have nice one. But my granddaughter, she likes to go on the lower road, you know that new road? She like to go on that road so we keep going until we see *a'ali'i* and we stop pull over and I go pick.

CA: Get some *lehua* up there too...

AA: That's where we go and pick up *lehua*. You know, I tried to bring home (to Waihe'e) some plants, *a'ali'i* plants, I tried but it won't grow. And then *kukui*.

CSH: For medicine?

AA: To put in raw fish, you know *poke*?

CA: *Inamona*.

AA: But you gotta bring it home, to take off the shell outside you dry it. Then you roast it then you crack the shell, and dig out all the meat in side, and then you pound come fine. And when you make *poke* you can use that. But the green fruit, you know the young babies when they are born, after a while they have that white cake on their tongue. Hawaiians say it's air, but actually it's from the milk, it curdles and leaves this massive white on the tongue, that makes the baby uncomfortable, cause can bleed. So they use the green fruit. They tear of the stem and put the juices on there clean the tongue.

CSH: So do you think this waterline would affect the gathering practices...do a lot of people in this area go to gather *lehua* and *a'ali'i*?

AA: I don't know. The times I go, there's nobody. Even on the highway, I don't see anybody picking on the highway. So I don't know. But I know I make use of those things up there. Now day there are a lot of leis have imitation kine flowers yeah? I don't like to wear imitation, so I tell my granddaughter, because she's off on the weekend. We take a ride up there and I pick up plenty and I put in the bag. When I come home I transfer it in the green vegetable bags, I put it in there, and it lasts long. It takes time though. My husband comes from a well off family. When we met, it was kind of hard. 'Til today it's still hard. Where group up in Kanaio and I like to eat those things sometimes like canned corned beef and tomato and onion. Then I miss tripe. But I still cook it because my grandchildren love to eat that when they come. Those days we didn't have the big kine tomatoes, we had the cherry tomatoes, you know the small one? That's what we used to use, we cut it in half then we throw it in with the corn beef...two cans make one big pot! So that's what we were brought up with. I miss that life, was so easy.

CSH: How did you and your husband meet?

AA: At a night club! My girlfriend said let's go! And I said no...no we go, just one night see how it feels to get out. And we were living Paukukalo that time, and mom was so strict, and I was 22. Then she said no we go, you know what? Climb through the window. (laughing) I said "Climb through the window?" Yeah climb through the window, and make it out your mom will not find out maybe 'til after you come home. I listened to them and I climbed through the window and they were waiting down the road and get into the car and we went. Used to be this place in Kihei... Aunty Becky's? That's where they always go so they took me there. And my sister was there! See she jumped out of the window and she even younger than me! And when I walked in ... oh! There was my sister; I didn't even look at her. Maybe she had pillow or blanket, that one get more guts than anything. I looked at her and I said "I thought you was at home!" She said "No, I jumped through the window." She asked "How did you come?" "I jumped through the window too!" So we sat down and he happened to be in there. We started dancing...and pretty soon he was bringing me home! I said "Oh my god! How the hell am I gonna get in there?" When I came home he dropped me off and I told him you know you just gotta drop

me off and make it out of here! He said "Why?" I said "Because my mother." He said "You think you can make it in?" Maybe it's not so bad I left the window little bit open so I can push it up but the screen is on the ground. But I made it in to the room, my mother was sleeping and the door was closed, I take-off my clothes, jump in the bed and I'm safe! But when my sister came home she had it, she got caught. So the next time he came he came to the door, knock on the door. And my mother came to the door and my father was sitting down drinking coffee and talking and then he came in and he told my mother about what had happened. He said "I don't want to hide. I came, brought home your daughter and she jumped through the window. But she escaped from home through the window with her friend" My mother looked at me and said "You lucky. You never got it." And he told my mom "You want to hit me? You hit me. You want to kick me out of here? You kick me out of here. But I not gonna stop coming by ... she probably jump through the window again."

AA: I wish I could help you more.

CSH: The eucalyptus tree area (grave locations) that you are talking about...

AA: If you know a beige color house a nice one, it's below of the Po'aipuni's. In fact, on the highway you going. There's a road the National Guard, yea in the Kanaio area, kept to go down there, there's a road on the left that goes up ... you can see it. The road that goes down to the National Guard you can see that eucalyptus tree up on the left. You gotta look, there's big eucalyptus trees right there. Now I don't know of any pipelines running through there. There's a little house right there close to the road, a little house, right there you look up you can see all that eucalyptus trees and it's right there. You can see it's all rocks, but that's a form of graves too yeah?

CSH: So really nothing up there, burials wise (up by the pipeline).

AA: Not that I know of.

CSH: Have you ever been to the strawberry patch?

AA: Oh no. Have you seen that Maui headstone?

CSH: Yeah! *Po'o kanaka* they call that?

AA: I don't know much about that though. That stone, I remember the last incident that happened. It's chipped, if you noticed if you looked at that stone, it's chipped on one side. You ever heard of this man, George Ka'ualalena, maybe mom knows, his daughter is Esther Campbell. Her father, he was a minister for 'Ulupalakua Protestant Church and the Kanaio Church but he used to go to other churches. I don't know what made him do that...he went over there and he hit the rock, that Maui stone. When he did that, he had a home down in Keoneo'io and the house in the back had a church but he used that. People never used that because it was so old but the pews were all in that church, but he had all these nets piled up. He had outside toilet. And my father them were living down in tents in Keoneo'io, he was a fisherman, and when he did that to that rock. My father said they were down in that tent ... that toilet... a big fire cause no roof, only sides. My father said a big fire

was coming out from the toilet...so my father then went up thinking maybe he had come and something wrong with the toilet. My father then went up, they walked up to the toilet, you know the toilet seat never moved...only inside. The board never was destroyed, nothing. My father then wondered what the hell is going on? The next day my brother came home and my brother told them, "Oh...you know Tutu Makeka died." I said how you know. Yeah the old man Manuia came to the house the house and told daddy that he died, he had commit suicide in the bedroom. They tried to get in the bedroom and they couldn't. They tried to break the door down to go inside because they could see him from the window. And then that night all us kids stayed home ... oh! We had to crawl under the bed. Our bedroom when we see there's a big tree by the window ... and there is no wind! That tree was shaking and banging the wall, oh we were all under the bed. So my father said maybe that was the guy telling somebody that he was gone. I don't know that kind stuff, only make us scared, and only three of us home. Oh my god, I never forget that. But he was a good minister. Because at the Kanaio Church, that's where I learned to talk Hawaiian, he was the *kahu*, then when pau church he used to tell me come down and read the bible to me in Hawaiian that's the only way I could learn. So I would go down and I would read to him, and he wants me to make him pancakes. He love pancakes. And when he died, I missed that...reading in Hawaiian. He used to help me with the words. But that's, yeah, bad (when he died). That's why I told my dad, you know dad Hawaiians are funny people, they're scary. He tell me, "It all depends how you look at it." I said well, I wasn't looking for something like that! He said, "Well good thing they never show you their face! It's worse, you would run for life!"

CSH: I don't know...spooky those stories...I tell people don't tell me anymore!

(laughing)

AA: Yeah. I don't know how much I can help.

CSH: You helped me a lot. We did an archaeological assessment through there so basically my end is more cultural, like your plant gathering and different stories about the area, like the *Po 'o Kanaka* story you just told me.

AA: Oh it's chipped on one side ... oh my god!

CSH: So I get to do the fun stuff.

AA: The fun and the spooky!

CSH: Do you know the name of this *pu 'u*? Up above.

AA: No not that I know of. That I think is by the radio station. That's *Pu 'u Mahoe*.

CSH: So the Kanaio area was mostly Hawaiian?

AA: Mhmm. Had quite a bit, but when we were there, there was only three families. I guess most of them passed on, moved away...

CSH: Then when you come this way (toward 'Ulupalakua) you see Japanese.

AA: Yeah. That Pu'u Mahoe, used to have a lot of servicemen camp up there ... that was their target range. They used to shoot from there down to Kanaio beach. And my mother used to be a maid for the radio station people. In the mean time she was doing laundry for the military men you know. And those days no more washing machine.

CSH: Do you think the development will have any effect on your plant gathering.

AA: No, it's all in the lava anyway. The *a'ali'i* is so spread out but the *lehua*, my favorite spot is on the upper road, the old road. I like it up there. And my husband told me the first time I took him to pick, "The Hawaiians, I wonder if they allow you to pick them." I said "Eh, before you even pick them, you say something. You don't go out there on the lava flow and just take!" He said, "Oh you know that kind stuff." I said, "My dad told me. You say something first before you harvest" So I guess I did my share because it's all right. Plenty of time's when I was working Waihe'e School they used to have lei contest. I used to go up, I would go up special just to go pick up *lehua* and *a'ali'i* and I come home and make *haku* lei. Every time I enter, I always win, and I see better kind leis than that. But the principle always ask me, "Where you get all this *lehua* and flowers." I say, "From country, from Kanaio." He says, "Kanaio! You go all the way up there to go get and come back and make lei and enter?" I said, "Yes. Because I don't have this kind in my yard. That's why I go all the way up there and make special." He said, "You know every year you do that, you always win." But I don't make the same colors. Maybe one year is the yellow *lehua* because they got it up there, and they got the pink, and they got the red. The pink you have to walk in far from the road and the red. Sometimes I mix yeah. The pink and yellow, sometimes the pink and red, and I always win, and I get ribbon. I don't care for the money, but the ribbons, I can show my grandkids. I even make one for the contest, one for the principle, and one for the vice-principle, and one for the cafeteria manager because that's where I work, in the cafeteria. That's why living down here is harder than living in the country. You live down here, everything is money, you gotta go to the store, you gotta buy this, and you gotta buy that. But you live in the country; you plant a lot of things and make use of it. But down here, even cabbage you gotta go to the store and buy. We used to plant our cabbage, but it didn't come as big like in the store, used to come so small, but it was cabbage. But down here you gotta go buy everything. I tell you down here more expensive than in the country. In the country we don't pay electricity, we get generator. Ice box, we had kerosene ice box. So we don't have to pay electric bill. We only gotta buy gas, and those days gas was not expensive like today. Stove we get kerosene stove. Then we have outside cook house, the tripe we would cook it outside, not in the house. So country life was cheap if you know how to live.

CSH: That's the key, knowing how to live.

AA: Yep, knowing how to survive. And even potatoes, Irish potatoes, they don't come big, come small. And bell peppers, we used to share with the below house the above house. I miss that life. And green onion, we had lots of that. And then we never had hot water to take a bath. So what we do is, before, late noon time, before we used to go in the *panini* and collect wood, you know *lantana* wood? Collect plenty and

bring it home and we go make hot water in the big tub, put it on the pipe and put the wood underneath. If you want to bathe hot water, you go make your own. Otherwise you bath cold water. But was cheap, way cheaper.

CSH: This road (the upper road) goes all the way to Kahikinui?

AA: I think so because this is the boundary yeah Kanaio.

CSH: Thank you for sharing your stories Aunty.